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Title of Thesis — Titre de la thèse
Issues in the Structure and Acquisition of Korean Anaphora

University — Université
U of Alberta

Degree for which thesis was presented — Grade pour lequel cette thèse fut présentée
Ph. D

Year this degree conferred — Année d'obtention de ce grade
1985

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ISSUES IN THE STRUCTURE AND ACQUISITION OF KOREAN ANAPHORA

by

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SOOK WHAN CHO

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF LINGUISTICS

EDMONTON, ALBERTA
FALL, 1985

THE UNIVERSITY OF ALBERTA

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ABSTRACT

The present thesis examines syntactic principles governing Korean reflexive pronoun caki and how they develop in children ranging in age from 4;1 to 11;7. It also studies the development of null anaphora, with special attention to whether Korean children's interpretation of null anaphora exhibits the type of directionality preference predicted by Lust & Mangione (1983).

Results indicate that subject-antecedent forward patterns of reflexive anaphora are learned earlier than object-antecedent cases. Furthermore, children perform better on backward types which involve the reflexive functioning as subject (e.g., **Self* saw *John*) than those in which the reflexive is direct object (e.g., *I pushed *self* in *John*'s room). With respect to null anaphora, results disconfirm the universal constraint postulated by Lust & Mangione (1983). Korean children are observed to perform significantly better on the forward patterns, just as English-speaking children do. Hence, it is tentatively concluded that children's interpretation of null anaphora is not organized in accordance with branching direction.

In relation to major findings, this thesis also inquires into the 'acquisition problem' of why grammatical principles are learned the way they are. The effect of discourse context, word order, semantic role and 'empathy' on children's interpretation of the reflexive pronoun is also investigated. A proposal is made that two kinds of

'positive data' are available for children to use in learning the grammar of the reflexive. It is further observed that while older children (Grades 1-5) are *selectively* sensitive to and are facilitated by discourse context, they are not seriously misguided by three other factors mentioned above. It is suggested that grammatical knowledge, once acquired, overrides pragmatic and processing strategies.

ACKNOWLEDGMENTS

I am very grateful to my supervisor, Dr. Bruce L. Derwing for his valuable comments and criticism throughout the research. I would also like to thank Dr. Matthew S. Dryer for his advice on Korean anaphora and experimental designs, in particular. I wish to thank Dr. John T. Hogan who provided me with insightful ideas for statistical analyses.

I would like to express my deep gratitude to my thesis committee members, Dr. William J. Baker (Chairman), Dr. Gay Bisanz (Department of Psychology), Dr. John T. Hogan, and Dr. Gary D. Prideaux and my external examiner, Dr. Susumu Kuno (Harvard University), for their interest and constructive advice. I am indebted to the faculty members at our Department of Linguistics, who have enriched my knowledge and understanding, and further provided me with financial assistance for the entire period of my stay. Their lectures and support have certainly made it possible for me to complete my Ph.D. programme.

A number of people have kindly cooperated with me in administering experiments in Seoul, Korea. Dr. Ki-Hyung Hong at the Korean Educational Development Institute arranged a kindergarten and an elementary school for my thesis project. Staff members at Young-Un Kindergarten and Mwun-Won Elementary School in Korea have been very helpful. Korean Community Language School in Edmonton also helped me in various ways in carrying out a pilot study. I am, of course, very grateful to all my subjects.

Most of all, I would like to thank my family for being my patient friends, advisers and all-time supporters. Their love and encouragement certainly helped me to overcome many different stages of struggle and to remain happy. Finally, I thank William D. O'Grady for sharing with me so much time and numerous ideas. William's patience, care and never-ending support have been and are indeed extraordinary.

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LIST OF ABBREVIATIONS

A	Accusative Case Marker
B	Free Backward Anaphora
	Backward Null Anaphora
*B	Blocked Backward Anaphora
C	Correct Response
Cause	Causative Morpheme
COMP	Complementizer
D	Dative Case Marker
Dc	Declarative Sentence Particle
(D)O	Direct Object
DRC	Distinct Rank Constraint
DTS	Discourse Topic Strategy
E	Experimenter
F	Free Forward Anaphora
	Forward Null Anaphora
G	Genitive
GR	Grammatical Relation
H	Honorific Marker
I	Incorrect Response
IO	Indirect Object
K&K	Kuno & Kaburaki (1977)
L	Locative Case Marker
L&M	Lust & Mangione (1983)
MDS	Minimal Distance Strategy
N	Nominative Case Marker
NA	Not Applicable

NC	Neutral Context
NP	Noun Phrase
O	Direct Object
Obl	Oblique Case Marker
P	Preposition or Postposition
PASS	Passive Morpheme
PC	Precedence Constraint
PD	Positive Data
Pl	Plural Marker
PP	Prepositional Phrase in a language like English Postpositional Phrase in a language like Korean
Ppl	Past Participle
Pr	Present Tense Particle
PRI	Priority Condition
Pt	Past Tense Particle
Q	Question Sentence Particle Questions
R	Relative (Pronoun) Particle
RG	Relational Grammar
RH	Relational Hierarchy
RS	Recency Strategy
S	Sentence (in syntactic trees) Subject (elsewhere)
STAC	Subject/Topic Antecedent Condition
T	Topic Case Marker Topic
TC	Topic Context

TG	Transformational-Generative Grammar
TM	Time Marker
TS	Test Sentence
UCA	Universal Constraint on Anaphora
V	Verb
VP	Verb Phrase

PART I

PROLOGUE

CHAPTER 1

INTRODUCTION

1.1. The Object of My Study

Children's acquisition of the syntactic principles governing anaphoric relations in natural language is the object of much interest in current linguistic work. Anaphora involves a relation in which an 'anaphor' (a pronoun, a reflexive, or even a null element) is interpreted with the help of an 'antecedent' (typically, a lexical NP) in the same sentence or discourse. For example, John can serve as antecedent for he in (1a), but not in (1b). (In this thesis, the asterisk (*) is used to indicate that the intended interpretive dependency (marked by underlines) is inadmissible. No symbol is used when coreference is allowed.)

(1) a. John thinks that he is happy.
    b. *He thinks that John is happy.

The anaphoric relation illustrated in (1) is often called 'pronominal anaphora'. Two other kinds of anaphora, which I will call 'reflexive anaphora' and 'null anaphora', are exemplified in (2) and (3), respectively.

(2) a. *Mary says that Jane loves herself.
    b. Mary says that Jane loves herself.

(3) While 0 reading, Tom fell asleep.

In (2) the reflexive, herself, must be coreferential with Jane (cf. 2b), but cannot be coreferential with Mary (cf.

2a); in (3) the null element (0) must be coreferential with Tom.

In this thesis I will be investigating the way in which Korean children develop reflexive and null anaphora. Although the development of English anaphora has been extensively studied over the years, relatively little attention has been paid to Korean. While a group of three Korean psycholinguists have conducted a longitudinal study of anaphora in children's spontaneous speech (Lee, Ahn & Lee 1982:260-277), no other observational or experimental studies have been done in this area, as far as I can determine.

Due to this lack of research, our understanding of the acquisition of Korean anaphora is minimal and is limited to children's spontaneous production. It is therefore important and necessary to conduct studies which will allow us to observe children's interpretation of various patterns of anaphora and thereby gain insights into the state of their immature grammatical knowledge. In an attempt to initiate this research program for Korean, I have built this thesis around a set of experimental tasks involving the comprehension and elicited imitation of a variety of anaphoric patterns.

1.2. Overview

This thesis is organized in the following way. Chapter two examines the syntax of the Korean reflexive pronoun caki. My discussion includes a critical review of the literature as well as the presentation of a tentative set of principles for the interpretation of the Korean reflexive pronoun. Chapters three and four describe the experimental methods used to study the acquisition of these principles and present the data which they yielded. Where appropriate, comparable acquisitional data from other languages is also presented in these chapters. Chapter five then takes up the acquisition problem by attempting to answer the question of how Korean children learn the principles for reflexive anaphora on the basis of exposure to the speech of those around them. Chapter six presents an experiment which seeks to test Lust & Mangione's (1983) hypothesis about a correlation between a language particular feature of syntactic structure (so-called 'branching direction') and children's preference for certain patterns of null anaphora. Finally, in chapter seven, a summary of major findings and closing remarks are made.

PART II

REFLEXIVE ANAPHORA

CHAPTER 2

KOREAN REFLEXIVE ANAPHORA

2.0. Preface

This chapter deals with the basic grammatical principles governing the interpretation of the Korean reflexive pronoun caki. Previous analyses are reviewed and an alternative proposal is made.

2.1. Review of Previous Analyses

The Korean reflexive anaphor caki ([jagi]) can only take as antecedent a third person singular noun phrase (NP) with a human referent. Thus in the sentences of (1), for example, the antecedent must be Tom.[1] (As before, underlines are used to indicate the intended interpretive dependency.)

(1) a. (I met Tom at self's home.)

Nay-ka Tom-ul caki-uy cip-eyse
I-N Tom-A self-G home-L

manna-ass-tta.
meet-Pt-Dc

b. (I met Tom at self's home.)

*Nay-ka Tom-ul caki-uy cip-eyse
manna-ass-tta.

Since nay ('I') is first person singular and therefore cannot be the antecedent, the interpretation indicated in (1b) is ungrammatical (i.e., coreference between nay and caki is not allowed).

In the past decade, various attempts have been made to explain the interpretation of the reflexive anaphor caki with reference to the syntactic representations of transformational grammar (TG). Among the principles which have been proposed is the Subject/Topic Antecedent Condition (STAC), first formulated by C. Lee (1973:68) and later adopted by Yang (1975) and H. Lee (1976).

(2) Subject/Topic Antecedent Condition (STAC):

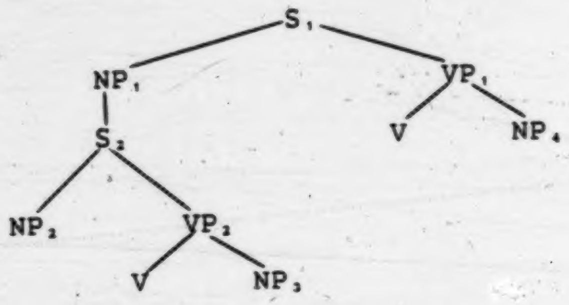
> Caki is coreferential with the Subject or Topic NP of any dominating sentence. In other words, when the Subject or Topic NP of a sentence is in [S-]command with caki, the latter is coreferential with the former.

The notion of 'S-command' comes from Langacker (1969:174) who defines it as follows.

(3) S-Command: X 'S-commands' Y if the lowest S-node that dominates X dominates Y.[2]

In a structure like (4), NP_2 S-commands NP_3 since the lowest S node over NP_2 (i.e., S_2) also dominates NP_3. Similarly, NP_4 S-commands both NP_2 and NP_3, because the lowest S node dominating it (i.e., S_1) also dominates these other two phrases. However, neither NP_2 nor NP_3 S-commands NP_4 since the first S node above them (S_2) does not dominate NP_4.

(4)


S_1
NP_1
VP_1
V
NP_4
S_2
NP_2
VP_2
V
NP_3

The STAC makes correct predictions about a number of sentences, one of which is exemplified in (5).

(5) a. (Tom threw, to Mary, self's book.)

Tom-i Mary-hanthey caki-uy chayk-ul
Tom-N Mary-D self-G book-A

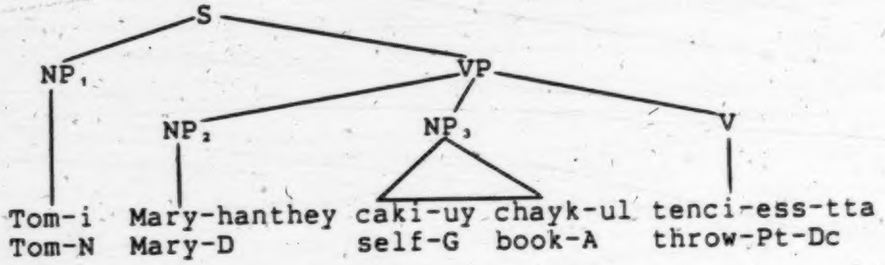
tenci-ess-tta.
throw-Pt-Dc

b. (Tom threw, to Mary, self's book.)

*Tom-i Mary-hanthey caki-uy chayk-ul
tenci-ess-tta.

The structure of (5) is illustrated in (5').

(5')


S
NP_1
VP
NP_2
NP_3
V
Tom-i
Tom-N
Mary-hanthey
Mary-D
caki-uy chayk-ul
self-G book-A
tenci-ess-tta
throw-Pt-Dc

In (5') both the subject Tom (NP_1) and the indirect object Mary (NP_2) S-command caki, as the S node dominating Tom and Mary also dominates caki. In this case the STAC stipulates that only the subject Tom can be the antecedent, correctly predicting that (5a), but not (5b), is grammatical.

The STAC further correctly predicts that in sentence (6) only the NP which S-commands the reflexive can be the antecedent.

(6) a. (The man who Tom met criticized self.)

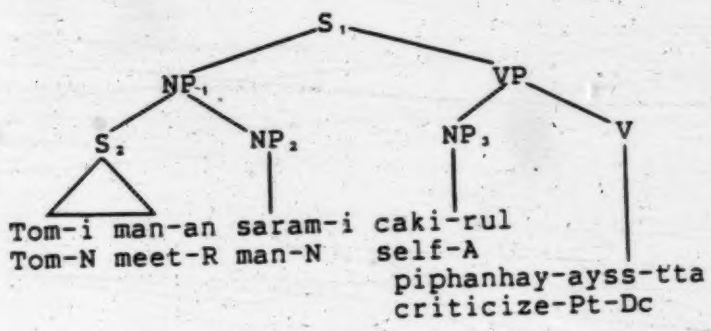
Tom-i man-an saram-i caki-rul
Tom-N meet-R man-N self-A

piphanhay-ayss-tta.
criticize-Pt-Dc

b. (The man who Tom met criticized self.)

*Tom-i man-an saram-i caki-rul
piphanhay-ayss-tta.

(6')


S_1
NP_1
VP
S_2
NP_2
NP_3
V
Tom-i man-an saram-i caki-rul
Tom-N meet-R man-N self-A
piphanhay-ayss-tta
criticize-Pt-Dc

In (6') NP_1 S-commands caki, while Tom cannot, because the lowest S node over the latter is S_2 which does not dominate the reflexive. As is indicated in (6), only the S-commanding NP (NP_1) can be the antecedent, and this is correctly accounted for by the STAC.

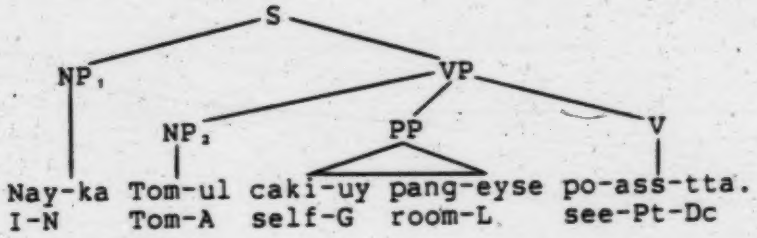
Unfortunately, however, the STAC incorrectly predicts the ungrammaticality of the sentence in (7).

(7) (I saw Tom in self's room.)

Nay-ka Tom-ul caki-uy pang-eyse
I-N Tom-A self-G room-L

po-ass-tta.
see-Pt-Dc

(7')


S
NP$_1$
VP
NP$_2$
PP
V
Nay-ka Tom-ul caki-uy pang-eyse po-ass-tta.
I-N Tom-A self-G room-L see-Pt-Dc

Since S is the lowest node dominating the NP$_2$ Tom and it dominates caki, the NP$_2$ S-commands caki. According to the STAC, Tom cannot be the antecedent, because it is not a subject. However, this is a wrong prediction since the sentence is perfectly grammatical in Korean.

The STAC also makes the wrong predictions about the sentences in (8).

(8) a. (I showed Tom self's new room.)

Nay-ka Tom-eykey caki-uy say pang-ul
I-N Tom-D self-G new room-A

poyecwu-ess-tta.
show-Pt-Dc

b. (I put Tom's book on self's desk.)

Nay-ka Tom-uy chayk-ul caki-uy
I-N Tom-G book-A self-G

chaykssang-wiy-ey noa-ass-tta.
desk-on-L put-Pt-Dc

The antecedent is the indirect object in (8a) and a genitive in (8b). Nevertheless, the sentences are acceptable.

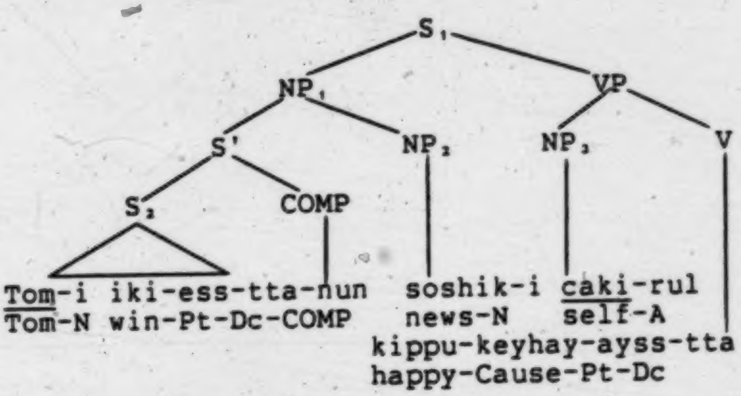
Moreover, contrary to what various versions of the STAC predict, the antecedent of the reflexive does not have to S-command it. Observe the following.

(9) ([The news [that [Tom won]]] pleased self).

[[[Tom-i iki-ess-tta]-nun] soshik-i]
Tom-N win-Pt-Dc-COMP news-N

caki-rul kippu-keyhay-ayss-tta.
self-A happy-Cause-Pt-Dc

(9')


S_1
NP_1
VP
S'
NP_2
NP_3
V
S_2
COMP
Tom-i iki-ess-tta-nun
Tom-N win-Pt-Dc-COMP
soshik-i
news-N
caki-rul
self-A
kippu-keyhay-ayss-tta
happy-Cause-Pt-Dc

In (9'), the intended antecedent Tom does not S-command caki since the first S node above it (S_2) does not include the reflexive. Yet the sentence is perfectly acceptable. It seems correct to conclude, then, that the STAC fails to account for important facts about Korean reflexive anaphora.

The fact that the Korean reflexive can take a nonsubject antecedent in certain cases (e.g., (8)) has been recognized by Kim (1976:71). She attempts to account for this fact with the help of several algorithms and constraints formulated in terms of 'S-command' and 'precedence'. Her constraints are unusual and interesting in that they have been designed to provide a probabilistic prediction of coreference relationships. One of her principles is stated as follows.

(10) If a nonsubject S-commands but does not immediately precede caki, then the probability that a nonsubject and caki

are coreferential must be (80-20X)%,
where X is the number of clauses
between caki and the nonsubject NP.

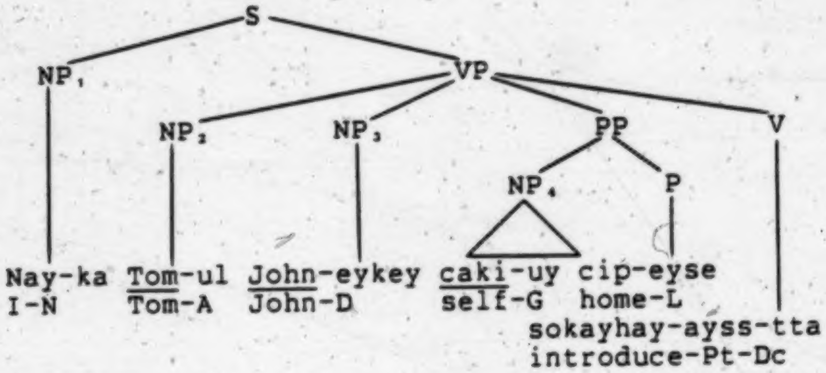
The constraint stated in (10) is intended to account for cases where speakers assign coreference to the nearer of two or more eligible antecedents. Consider in this respect the following ambiguous sentence.

(11) (I introduced Tom to John at self's home.)

Nay-ka	Tom-ul	John-eykey	caki-uy	cip-eyse
I-N	Tom-A	John-D	self-G	home-L

sokayhay-ayss-tta.
introduce-Pt-Dc

(11')


S
VP
NP_1
NP_2
NP_3
PP
V
NP_4
P
Nay-ka
I-N
Tom-ul
Tom-A
John-eykey
John-D
caki-uy
self-G
cip-eyse
home-L
sokayhay-ayss-tta
introduce-Pt-Dc

Sentence (11) is ambiguous in that either NP, Tom or John, can be the antecedent. It is conceivable, however, that speakers may prefer one interpretation over the other and that Kim's constraint may play a role in predicting such a preference. As the configuration in (11') shows, both Tom (NP_2) and John (NP_3) S-command and precede caki, but John also 'immediately precedes' it. Kim's principle therefore predicts that the probability that Tom will be interpreted as antecedent is only 80% (i.e., 80-20X, where X is 0 since there is no clause boundary between Tom and caki). While the question of whether speakers really do exhibit the predicted preference is an open one, Kim's approach does have the merit of at least having something to say about preferred readings in ambiguous cases like (11). (I personally have no preference.)

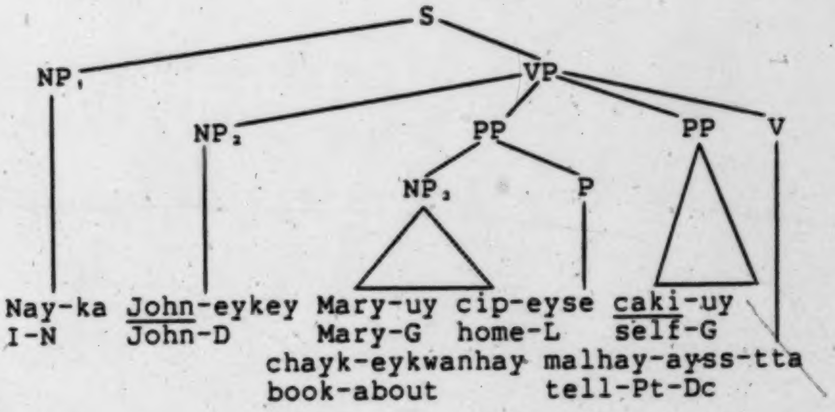
A problem with Kim's principle is that it fails to explain why a sentence like (12) is perfectly grammatical.

(12) (I told John, at Mary's home, about self's book.)

Nay-ka John-eykey Mary-uy cip-eyse caki-uy
I-N John-D Mary-G home-L self-G

chayk-eykwanhay yeykihay-ayss-tta.
book-about tell-Pt-Dc

(12')


S
NP₁
VP
NP₂
PP
PP
V
NP₃
P
Nay-ka
I-N
John-eykey
John-D
Mary-uy
Mary-G
cip-eyse
home-L
caki-uy
self-G
chayk-eykwanhay
book-about
malhay-ayss-tta
tell-Pt-Dc

In (12') the nonsubject John (indirect object NP₂) S-commands but does not immediately precede caki since the other nonsubject Mary (under NP₃) is closer to the anaphor. Thus, for Kim the probability that John and caki are coreferential is only 80% (80-20X = 80) (X=0 since the number of clause boundaries between John and caki is zero). In fact, however, coreference between John and the reflexive is perfectly obligatory in (12). This fact is not adequately handled by the constraint as it is currently stated.

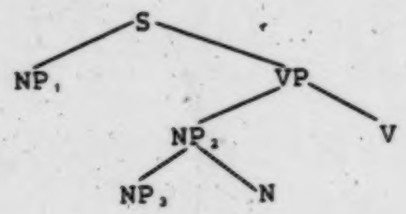
Recently, Koster (1983) has proposed a new analysis for Korean reflexives in which 'k-command' plays a critical role. The notion of 'k-command' comes from Lasnik (1976), who defines it as follows.

(13) k-command:

> X k-commands Y if the first cyclic node dominating X dominates Y (where the cyclic nodes are NP and S).

'K-command' differs from 'S-command' in that the former counts either NP or S while the latter considers only S. Observe the structure in (14).

(14)



In (14) NP_1 both k-commands and S-commands NP_2 and NP_3 since the first cyclic node over NP_1 is S, which dominates the other two phrases. On the other hand, whereas NP_3 S-commands NP_1 (since the lowest S node dominating NP_3 also dominates NP_1), NP_3 does not k-command NP_1 (since the first cyclic node above it, NP_2, does not dominate NP_1).

Employing the concept of 'k-command', Koster (ibid.) proposes the following principle.

(15) Any k-commanding subject is a possible antecedent. [O]nly subjects can be

antecedents.

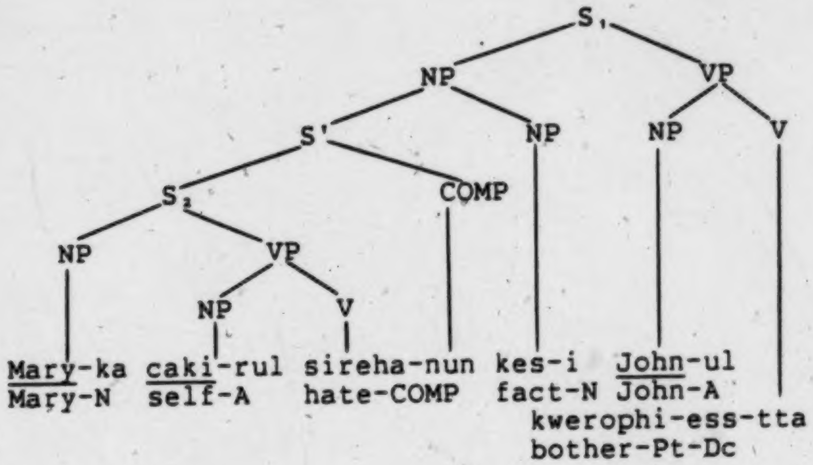
Koster's principle does not constitute an improvement over the STAC and, like the latter principle, makes a wrong prediction for sentences like (16).

(16) ([That Mary hates self] bothered John).

[Mary-ka caki-rul sireha-nun] kes-i
Mary-N self-A hate-COMP fact-N

John-ul kwerophi-ess-tta.
John-A bother-Pt-Dc

(16')


S_1
NP
VP
S'
NP
NP
V
S_2
COMP
NP
VP
NP
V
Mary-ka
Mary-N
caki-rul
self-A
sireha-nun
hate-COMP
kes-i
fact-N
John-ul
John-A
kwerophi-ess-tta
bother-Pt-Dc

Sentence (16) is ambiguous in that caki can refer to either Mary or John. Koster can account for the fact that caki is coreferential with Mary, since Mary is a subject in the embedded sentence and k-commands self (i.e. the first cyclic node over Mary, S_2, dominates caki). However, his principle incorrectly predicts that John cannot be the antecedent since it is not a subject. Thus Koster's constraint is inadequate.

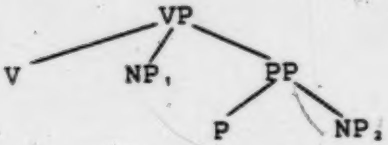
Another recent analysis comes from Yang (1983) who uses the notion 'c(onstituent)-command' which is defined in

Reinhart (1981:184) as follows.

(17) *c-command*: X c-commands Y if and only if the first branching node dominating X dominates Y, and X does not dominate Y, nor Y, X.

This can be illustrated with the help of the structure in (17').

(17')



In (17') P c-commands NP_2 since the first branching node dominating P (i.e., PP) dominates NP_2, and P and NP_2 do not dominate each other. On the other hand, P does not c-command NP_1, because the PP above it does not dominate NP_1.

Using this concept, Yang (*ibid*.:184) proposes the following principle.

(18) ...the reflexives of [Korean, Japanese, and Kannada] are bound by any c-commanding subject.

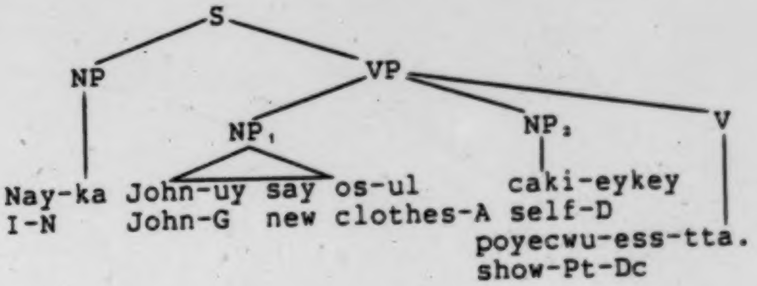
Unfortunately, the principle (18) fails to make the correct prediction for a simple case like (19).

(19) (I showed *John*'s new clothes to *self*.)

Nay-ka *John*-uy say os-ul *caki*-eykey
I-N *John*-G new clothes-A *self*-D

poyecwu-ess-tta.
show-Pt-Dc

(19')



Contrary to Yang's constraint, *John* can be the antecedent in (19), although it does not c-command the reflexive. Notice that the first branching node above *John* (i.e., NP$_1$) does not dominate NP$_2$.

Finally, it seems that the interpretation of the Korean reflexive pronoun also cannot be adequately characterized by the universal principle in (20) mentioned by Johnson (1977:157) within Relational Grammar (RG).

(20) *Reflexivization Law*:

Only terms [S, DO, and IO] can trigger reflexivization.

Contrary to the prediction made by (20), a nonterm (genitive) can trigger reflexivization in Korean, as (21) indicates.

(21) (*John*'s book was lying on *self*'s desk.)

John-uy chayk-i *caki*-uy chaykssang-wiy-ey
John-G book-N *self*-G desk-on-L

noyeise-ess-tta.
lie-Pt-Dc

In (21), the genitive *John* can be the antecedent of the reflexive - unlike the requirement stated in (20) above.

By pointing out the weaknesses in the previous analyses, I do not intend to suggest that a transformational or relational approach to Korean anaphora must necessarily be rejected. It is always conceivable that further work within these frameworks will produce a better account of Korean anaphora. Such work might involve, for example, the refinement of structural notions like S-command or k-command, or even new proposals about the organization of phrase structure in Korean. It is not my purpose here, however, to explore solutions to the problems which the interpretation of caki presents for TG or RG. In the section that follows, I propose an analysis in which grammatical relations (e.g., subject, direct object, etc.) play a major role. I will begin by describing a 'Relational Hierarchy' for Korean, and I will then demonstrate how this device contributes to an explanation of Korean reflexive anaphora.

2.2. Alternative Analysis

2.2.1. Relational Hierarchy

In presenting a Relational Hierarchy (RH) for Korean reflexive anaphora, I will not attempt to present definitions for individual grammatical relations. However, I assume that the identification of the grammatical relations (GRs) manifested in the sentences relevant to this thesis is uncontroversial. Table 2.1 below outlines the case markers and corresponding GRs, which I have adopted for the purpose of this discussion.[3]

Table 2.1

Korean Case Markers

Case Marker	Grammatical Relation	C___	/ V___
Topic	Topic	*un*	*nun*
Nominative	Subject	*i*	*ka*
Accusative	Direct Object	*ul*	*rul*
Dative	Indirect Object	*eykey*	
Genitive	Possessive	*uy*	

A crucial fact about Korean is that when a sentence contains two or more third person NPs, the interpretation of *caki* is sensitive to the GRs of these phrases. Observe first the sentences in (1).

(1) a. (*John* caught Tom at *self*'s home.)

John-i Tom-ul *caki*-uy cip-eyse
John-N Tom-A *self*-G home-L

pwuccab-ass-tta.
catch-Pt-Dc

b. (John caught *Tom* at *self*'s home.)

*John-i *Tom*-ul *caki*-uy cip-eyse
pwuccab-ass-tta.

There are two NPs in each sentence in (1), the subject *John* and the direct object *Tom*. Since each NP is in the third person with a human referent, it is in theory eligible to serve as antecedent for the reflexive. Significantly, however, only the subject phrase serves as antecedent in this case.

On the basis of this observation, we might therefore assume that a subject must be chosen as antecedent in preference to an object. We can represent this fact by means of the RH depicted in (2) ('>' means 'higher in the hierarchy').

(2) Subject (S) > Direct Object (DO)

One might question at this point whether semantic roles rather than GRs determine which NP is the antecedent. In (1), for example, the antecedent is semantically 'agent', and one might argue that an NP bearing this semantic role must be selected as the antecedent over other NPs in Korean. The evidence that follows indicates that GRs rather than semantic roles are the deciding factor.

(1') a. (Tom was caught by John at self's home.)

Tom-i John-hanthey caki-uy cip-eyse
Tom-N John-Obl (by) self-G home-L

pwuccap-hi-ess-tta.
catch-PASS-Pt-Dc

b. *Tom-i John-hanthey caki-uy cip-eyse
pwuccap-hi-ess-tta.

Notice that in (1'a), the subject phrase Tom is patient rather than agent. Nevertheless, it is selected as antecedent over the agent John - a fact which points to the primacy of GRs.

Consider now some additional kinds of sentences.

(3) a. (As for John, (he) pushed Tom in self's company.)

John-un Tom-ul caki-uy hoysa-eyse
John-T Tom-A self-G company-L

mil-ess-tta.
see-Pt-Dc

b. (As for John, (he) pushed Tom in self's company.)

*John-un Tom-ul caki-uy hoysa-eyse
mil-ess-tta.

Each sentence in (3) involves two third person NPs, the topic John and the direct object Tom. As the grammaticality facts indicate, only John (the topic) can be the antecedent of caki. This suggests the following hierarchy.

(4) Topic (T) > DO

(4) indicates that a topic is higher in the hierarchy than a direct object and is therefore chosen over it as antecedent for the reflexive.

The sentences in (5) are relevant for determining the relative rank of the topic and the subject in the hierarchy.

(5) a. (As for Tom, John pushed (him) in self's company.)

Tom-un John-i caki-uy hoysa-eyse
Tom-T John-N self-G company-L

mil-ess-tta.
push-Pt-Dc

b. (As for Tom, John pushed (him) in self's company.)

Tom-un John-i caki-uy hoysa-eyse
mil-ess-tta.

As (5) shows, coreference is allowed between caki and either the subject or topic. That is, the sentence in (5) is ambiguous in that the reflexive can refer either to the topic Tom or to the subject John. No priority is given to either of these NPs as far as the assignment of coreference is concerned. This points to the validity of (6), in which topic and subject have the same rank in the hierarchy.

(6) $\left\{\begin{matrix} S \\ T \end{matrix}\right\} > \text{DO}$

The rank of an indirect object in our relational hierarchy can be determined with the help of the following sentences (7).

(7) a. (I introduced *John* to Tom in *self*'s company.)

Nay-ka *John*-ul Tom-eykey *caki*-uy
I-N *John*-A Tom-D *self*-G

hoysa-eyse sokayhay-ayss-tta.
company-L introduce-Pt-Dc

b. (I introduced John to *Tom* in *self*'s company.)

Nay-ka John-ul *Tom*-eykey *caki*
-uy hoysa-eyse sokayhay-ayss-tta.

In (7) *John* (the direct object) and *Tom* (the indirect object) are the two third person NPs. Significantly, either can serve as antecedent of the reflexive and neither appears to have priority over the other. This seems to show that an indirect object and a direct object occupy the same rank in the hierarchy as illustrated in (8).

(8) $\left\{\begin{matrix} T \\ S \end{matrix}\right\} > \left\{\begin{matrix} \text{DO} \\ \text{Indirect Object (IO)} \end{matrix}\right\}$

The inferiority of indirect objects to subjects is confirmed by sentences such as (9).

(9) a. (*Tom* threw John *self*'s ball.)

Tom-i John-eykey *caki*-uy kong-ul
Tom-N John-D *self*-G ball-A

tenci-ess-tta.
throw-Pt-Dc

b. (Tom threw John self's ball.)

*Tom-i John-eykey caki-uy kong-ul
tenci-ess-tta.

As predicted by (8), the subject Tom, but not the indirect object John, serves as antecedent in (9).

Now consider the sentences in (10), which involve a possessive John and a direct object John-uy chinkwu ('John's friend').

(10) a. (I saw John's friend at self's home.)

Nay-ka John-uy chinkwu-rul caki-uy
I-N John-G friend-A self-G

cip-eyse po-ass-tta.
home-L see-Pt-Dc

b. (I saw John's friend at self's home.)

*Nay-ka John-uy chinkwu-rul caki-uy
cip-eyse po-ass-tta.

As (10) indicates, only the direct object John-uy chinkwu ('John's friend') can serve as antecedent for the reflexive. Observe also (11), which shows that an indirect object has priority over a genitive in the interpretation of the reflexive.

(11) a. (I showed John's friend self's new room.)

Nay-ka John-uy chinkwu-eykey caki-uy say
I-N John-G friend-D self-G new

pang-ul poyecwu-ess-tta.
room-A show-Pt-Dc

b. (I showed John's friend self's new room.

*Nay-ka John-uy chinkwu-eykey caki-uy say
pang-ul poyecwu-ess-tta.

This suggests both the direct object and the indirect object take priority over a genitive in the interpretation of reflexives and are therefore higher in the hierarchy. This is illustrated in (12).

(12) $\begin{Bmatrix} \text{DO} \\ \text{IO} \end{Bmatrix} >$ Genitive (G)

As one would expect, the sentences in (13) indicate that either a subject or a topic is also higher in the hierarchy than a genitive.

(13) a. (*John's friend* threw *self*'s ball./ As for *John's friend*, (he) threw *self*'s ball.)

John-uy chinkwu-ka/-nun *caki*-uy kong-ul
John-G friend -N/-T self-G ball-A

tenci-ess-tta.
throw-Pt-Dc

b. (*John*'s friend threw *self*'s ball./ As for *John*'s friend, (he) threw *self*'s ball.)

**John*-uy chinkwu-ka/-nun *caki* kong-ul
tenci-ess-tta.

As we can see in (13), both the subject and the topic have priority over the genitive in the interpretation of *caki*. This supports the following version of the RH.

(14) $\begin{Bmatrix} \text{S} \\ \text{T} \end{Bmatrix} > \begin{Bmatrix} \text{DO} \\ \text{IO} \end{Bmatrix} >$ G

The sentences in (15) help determine the status of an embedded NP in the hierarchy. (Here the term 'embedded NP' refers to an NP occurring within an NP or an S which does not include the reflexive.)[4]

(15) a. (I saw the man [who knew John] at
self's home.)

Nay-ka [John-ul a-nun] ku namca-rul
I-N John-A know-R the man-A

caki-uy cip-eyse po-ass-tta.
self-G home-L see-Pt-Dc

b. (I saw the man [who knew John] at
self's home.)

*Nay-ka [John-ul a-nun] ku namca-rul
caki-uy cip-eyse po-ass-tta.

In (13), the embedded NP John and the direct object headed by namca ('man') are the two third person NPs. As indicated by the contrast in (15), only the direct object can be the antecedent. On the basis of this, we can tentatively conclude that a direct object is higher than an embedded NP in the RH. I illustrate this in (16).

(16) $\begin{Bmatrix}\text{DO}\\ \text{IO}\end{Bmatrix}$ > Embedded NP

In (10) - (16) we have observed that direct and indirect objects are higher than either a genitive or an embedded NP. However, we have not yet examined the status of genitives and embedded NPs with respect to each other in the hierarchy. Sentences like (17) suggest that the two occupy the same rank.

(17) a. (I reported the news that [Tom won] at
John's home to self's friend.)

Nay-ka [Tom-i iki-ess-tta-nun] soshik-ul
I-N Tom-N win-Pt-Dc-R news-A

John-uy cip-eyse caki-uy chinkwu-eykey
John-G home-L self-G friend-D

ali-ess-tta.
report-Pt-Dc

b. (I reported the fact [Tom won] at John's home to self's friend.)

Nay-ka [Tom-i iki-ess-tta-nun] soshik-ul John-uy cip-eyse caki-uy chinkwu-eykey ali-ess-tta.

Both (17a) and (17b) are acceptable, the implication being that the reflexive can refer to either a genitive or an embedded NP when no other antecedent is available. Thus (18) places both types of NP in the same rank.

(18) $\begin{Bmatrix} \text{DO} \\ \text{IO} \end{Bmatrix} > \begin{Bmatrix} \text{Embedded NP} \\ \text{G} \end{Bmatrix}$

In (19) I combine (14) and (18) to make a more general RH.

(19) $\begin{Bmatrix} \text{S} \\ \text{T} \end{Bmatrix} > \begin{Bmatrix} \text{DO} \\ \text{IO} \end{Bmatrix} > \begin{Bmatrix} \text{Embedded NP} \\ \text{G} \end{Bmatrix}$

A curious feature of the hierarchy (19) is that S and T share a single rank, as do DO and IO. This contrasts with the hierarchy in (20) which has been proposed for linguistic phenomena in a number of other languages (Keenan and Comrie 1977:66, and Johnson 1977:156, among others).

(20) S > DO > IO > ...

As we shall see shortly, the RH in (19) is justified because of the central role it plays in explaining various anaphoric phenomena in Korean. In the discussion that follows, I will focus on the structures involving two third person NPs as well as on acceptable and blocked cases.

2.2.2. The Priority Condition

The Relational Hierarchy (RH) summarized in the previous section plays a central role in explaining various anaphoric phenomena in Korean. For example, the RH implies the following principle 1for cases involving more than one third person NP. (In (1) below, 'eligible' refers to 'third person NP with human referent, and 'higher' means 'higher in the RH'.)

(1) Priority Condition (PRI)

Choose the highest eligible NP as the antecedent.

The PRI accounts for the grammaticality facts associated with the sentences in (1), (3), (10), (13) and (15) in the preceding section. This principle also allows the sentences of (5), (7), and (17) to be ambiguous because the NPs in each sentence have the same rank in the hierarchy and are hence equally able to function as antecedents.

2.2.3. The Precedence Constraint

The Relational Hierarchy (RH) is also crucial for explaining anaphoric relations in sentences containing only one third person NP in addition to caki. In the following we will observe that in cases where an antecedent follows an anaphor (so-called 'Backward Anaphora'), coreference is generally allowed only if the antecedent is higher than caki. (I call such acceptable cases 'Free Backward' patterns.) Let us begin by considering the following examples.

(1) a. (Self, Tom likes.)

Caki-rul Tom-i coaha-an-ta.
self-A Tom-N like-Pr-Dc

b. (Self, as for Tom, likes. (The meaning is 'As for Tom, (he) likes self'.))

Caki-rul Tom-un coaha-an-ta.
self-A Tom-T like-Pr-Dc

c. (To self, Tom threw a ball.)

Caki-eykey Tom-i kong-ul tenci-ess-tta.
self-D Tom-N ball-A throw-Pt-Dc

d. (Self's brother pushed Tom.)

Caki-uy tongsayng-i Tom-ul mil-ess-tta.
self-G brother-N Tom-A push-Pt-Dc

e. (Self's brother gave a book to Tom.)

Caki-uy tongsayng-i Tom-eykey chayk-ul
self-G brother-N Tom-D book-A

cwu-ess-tta.
give-Pt-Dc

Table (1') indicates the ranks of the reflexive and its antecedent in each sentence in (1).

(1')

Sentence	Antecedent		Reflexive
(1) a.	Tom (S)	>	caki (DO)
b.	Tom (T)	>	caki (DO)
c.	Tom (S)	>	caki (IO)
d.	Tom (DO)	>	caki (G)
e.	Tom (IO)	>	caki (G)

As (1') shows, the antecedents in these cases are all higher than the anaphors.

The following sentences illustrate what happens when the grammatical relation (GR) of the antecedent (represented as 'NP') is lower than or equal to the anaphor.

(2) a. (I showed self to Tom in the mirror.)

*Nay-ka caki-rul Tom-eykey kewul-lo
I-N self-A Tom-D mirror-with

poyecwu-ess-tta.
show-Pt-Dc

b. (I showed, to self, Tom in the mirror.)

*Nay-ka caki-eykey Tom-ul kewul-lo
I-N self-D Tom-A mirror-with

poyecwu-ess-tta.
show-Pt-Dc

c. (As for self, Tom hates (himself).)

*Caki-nun Tom-i miweha-an-ta.
self-T Tom-N hate-Pr-Dc

d. (Self, as for Tom, hates. (The meaning
is 'As for Tom, self hates (Tom).))

*Caki-ka Tom-un miweha-an-ta.
self-N Tom-T hate-Pr-Dc

(2')

Sentence	Antecedent		Reflexive
(2) a.	*Tom (IO)	=	caki (DO)
b.	*Tom (DO)	=	caki (IO)
c.	*Tom (S)	=	caki (T)
d.	*Tom (T)	=	caki (S)

These facts suggest that when the antecedent is equal in rank to the anaphor, coreference is blocked. (I call such backward patterns 'Blocked Backward'.) If we look at some additional examples, however, we find that equality in the RH does not always result in blocked coreference. Consider in this regard (3).

(3) (I, at self's home, read Tom's book.)

Nay-ka caki-uy cip-eyse Tom-uy chayk-ul
I-N self-G home-L Tom-G book-A

ilke-ess-tta.
read-Pt-Dc

In (3) the antecedent Tom (a genitive) is equal to caki (also a genitive) in terms of its rank in the RH. Unlike the cases in (2), however, sentence (3) is grammatical. I will suggest below the relevant difference between (2) and (3) is that in the former case the antecedent is a *non-embedded NP* (S, T, or object), whereas in the latter it is not.

The next set of sentences illustrates cases in which the antecedent is lower than the anaphor.

(4) a. (I pushed self at Tom's home.)

*Nay-ka caki-rul Tom-uy cip-eyse
I-N self-A Tom-G home-L

mil-ess-tta.
push-Pt-Dc

b. (I gave, to self, Tom's book.)

*Nay-ka caki-eykey Tom-uy chayk-ul
I-N self-D Tom-G book-A

cwu-ess-tta.
give-Pt-Dc

c. (Self hates Tom.)

*Caki-ka Tom-ul miweha-an-ta.
self-N Tom-A hate-Pr-Dc

d. (As for Self, (self) gave a ball to Tom.)

*Caki-nun Tom-eykey kong-ul cwu-ess-tta.
self-T Tom-D ball-A give-Pt-Dc

(4')

Sentence	Antecedent		Reflexive
(4) a.	*Tom (G)	<	caki (DO)
b.	*Tom (G)	<	caki (IO)
c.	*Tom (DO)	<	caki (S)
d.	*Tom (IO)	<	caki (T)

As (4') shows, the antecedent in the ungrammatical cases is lower than the anaphor. In Table 2.2 below, I summarize the phenomena that we have observed in (1) - (4').

Table 2.2

Coreference Conditions for Backward Anaphora

Free	Examples
a. caki < NP	(1)
b. Embedded caki = NP (genitive)	(3)
Blocked	
c. *caki > NP	(4)
d. *Non-embedded caki = NP	(2)

The conditions in Table 2.2 can collapse and be described as follows.

(5) a. Coreference is allowed in the backward pattern when the antecedent is higher than the anaphor (condition (a) but not (c)).

b. When the antecedent and the anaphor are equal in rank (as in (b) and (d)), coreference is allowed only when the reflexive is a genitive (the case (b)).

(5a)-(5b) can be generalized in a maximally simple way by positing the following principle.

(6) The Precedence Constraint

A non-embedded reflexive can only precede a higher antecedent.

Notice that (6) rules out (c) and (d) in Table 2.2 in which a non-embedded reflexive precedes an antecedent which is lower or equal in rank, but allows (a) in which a reflexive precedes a higher antecedent and (b) in which an embedded reflexive occurs before an antecedent which is equal to it in rank.

2.2.4. A Note on Multiclausal Sentences

Both the Priority Condition (PRI) and the Precedence Constraint (PC) are intended to apply in any clause containing caki and a potential antecedent. This is illustrated in (1).

(1) ($[_{S_2}$ John thought that $[_{S_1}$ I hit Mary in self's room $_{S_1}]$ $_{S_2}]$.)

$[_{S_2}$ John-i	$[_{S_1}$ nay-ka	Mary-rul	caki-uy	pang-eyse
John-N	I-N	Mary-A	self-G	room-L

ttayli-ess-tta- $_{S_1}]$-ko	sayngkakhay-ayss-tta $_{S_2}]$.
hit-Pt-Dc-COMP	think-Pt-Dc

In (1) the reflexive can be coreferential with either John or Mary. This is because the embedded sentence in S, Mary is the only eligible NP and hence automatically the highest antecedent in accordance with the PRI. In the matrix sentence S, the PRI allows only the matrix subject John to be the antecedent since it is higher than Mary (the embedded NP).

In a sentence like (2), on the other hand, the reflexive can refer only to John.

(2) a. ([$_{S_2}$ [$_{S_1}$ That self criticized Mary $_{S_1}$] bothered John $_{S_2}$].)

[$_{S_2}$ [$_{S_1}$ Caki-ka Mary-rul piphanhay-ayss-tta- $_{S_1}$]
self-N Mary-A criticize-Pt-Dc

nun sashil-i John-ul kwelophi-ess-tta $_{S_2}$].
COMP fact-N John-A bother-Pt-Dc

b. ([$_{S_2}$ [$_{S_1}$ That self criticized Mary $_{S_1}$] bothered John $_{S_2}$].)

*[$_{S_2}$ [$_{S_1}$ Caki-ka Mary-rul piphanhay-ayss-tta- $_{S_1}$]
nun sashil-i John-ul kwelophi-ess-tta $_{S_2}$].

The reason is that coreference between caki and Mary is blocked in the embedded S, since the reflexive (subject) precedes a lower antecedent Mary (direct object) in violation of the PC (see (2b)). In S_1, however, the PC is not violated since the reflexive pronoun is an embedded NP and thus now precedes a higher antecedent John (the direct object) (see (2a)).

2.3. Summary

In this chapter I have discussed Korean reflexive anaphora, critically reviewing previous analyses where appropriate. In addition, an alternative analysis using grammatical relations has been proposed in an attempt to develop principles for the interpretation of Korean reflexive anaphora (i.e., the Priority Condition and the Precedence Constraint). In the following chapters, I will present experimental evidence bearing on children's acquisition of these principles.[5]

Notes to Chapter 2

1. Korean and Japanese examples in this thesis are transliterated on the basis of the Yale Romanization Systems in Beginning Korean by Martin and Lee (1969:575). Hyphens are used to indicate morpheme boundaries.

2. When this notion was first developed, it was simply termed 'command'. Now it is called 'S-command' to distinguish it from other types of dominance relations mentioned below. I will consistently use the term 'S-command' in this dissertation.

3. I take the Korean topic to be a sentence-level category marked by the affix -un/-nun and typically corresponding to a focussed element which is either discourse theme or contrasted phrase. Of course, not all focussed elements are encoded as sentence-level topics. For the purposes of this thesis, the crucial point is topic-marked phrases have a special status in the Relational Hierarchy used in the interpretation of the reflexive.

4. For instance, Mary in (16) (section 2.1) is not an 'embedded NP' in this sense.

5. Due to the limitations imposed by the experimental components of my thesis, I do not consider the principle required for blocked forward patterns of anaphora.

CHAPTER 3

THE DEVELOPMENT OF FORWARD ANAPHORA

3.0. Preface

We have observed in chapter two various phenomena involving the reflexive *caki*. Two grammatical principles, the Priority Condition and the Precedence Constraint, have been proposed. Chapters three and four will investigate how these syntactic constraints develop in children. First, the present chapter examines children's interpretation of patterns of forward anaphora in which two third person NPs precede *caki* ('Forward Anaphora').

3.1. Purpose

Our concern here is with the child's sensitivity to the 'Priority Condition' (PRI), in which the 'Relational Hierarchy' (RH) plays a crucial role, as discussed in chapter two. The PRI and the RH are repeated here for convenience.

(1) *Priority Condition (PRI)*

Choose the highest eligible NP as antecedent.

(2) *Relational Hierarchy (RH)*

$$\begin{Bmatrix} \text{T} \\ \text{S} \end{Bmatrix} > \begin{Bmatrix} \text{DO} \\ \text{IO} \end{Bmatrix} > \begin{Bmatrix} \text{G} \\ \text{Embedded NPs} \end{Bmatrix}$$

3.2. Method

3.2.1. Subjects

Sixty children ranging in age from 4;1 to 11;7 participated in the experiment. They were selected from those who were regarded by their teachers to be at an average academic level. The children, all of whom were from middle class families living in Seoul, Korea, were divided into five age groups. The mean age and the age range of each group are shown in Table 3.1 below.

Table 3.1

Subjects

Age Level		Age Range	Mean Age
Kindergarten 1	(K1)	4;1 - 4;11	4;6
Kindergarten 2	(K2)	5;3 - 6;2	5;8
Grade 1	(G1)	6;8 - 7;6	7;1
Grade 3	(G3)	8;7 - 9;7	9;1
Grade 5	(G5)	10;7 -11;7	11;2

3.2.2. Linguistic Materials

3.2.2.1. Condition One

Due to obvious limitations on the child's attention span and endurance, my study focusses on only three components of the hierarchy, namely, 'S(ubject) > O(bject, direct) > G(enitive)'. Thus the following hierarchical relations are examined.

a. S > O

When a sentence contains two third person NPs, one S and one O, the subject NP must be the antecedent since it is higher in the RH.

(1) (Tom pushed Mary at self's home.)

Tom-i Mary-rul caki-uy cip-eyse
Tom-N Mary-A self-G home-L

mil-ess-tta.
push-Pt-Dc

b. O > G

When two third person NPs, one O and one G, occur in a sentence, the O must serve as antecedent since it is higher in the RH.

(2) (I pushed the child's brother at self's home.)

Nay-ka iai-uy tongsayng-ul caki-uy
I-N the child-G brother-A self-G

cip-eyse mil-ess-tta.
home-L push-Pt-Dc

In my study, phrases consisting of two common nouns (e.g. the child's friend) rather than a combination of common and proper nouns (e.g., Tom's friend) were used. This was to avoid the possibility that proper nouns might be more salient than common nouns for children.

c. S > G

When a sentence contains two third person NPs, one S and one G, the former is chosen as antecedent for the reflexive because of its higher rank in the RH.

(3) (Tom touched, in John's room, self's hat.)

Tom-i John-uy cip-eyse caki-uy moca-rul
Tom-N John-G home-L self-G hat-A

manci-ess-tta.
touch-Pt-Dc

The sentences exemplified in (1) - (3) are named SO, GO, and SG, respectively, after the relative order of the grammatical relations associated with the two NPs in each sentence. For example, a sentence like *Tom* pushed Mary at *self*'s home is referred to as SO, since the first NP (Tom) is S while the second (Mary) is O. Table 3.2 summarizes these three constructions.[1]

Table 3.2

Test Sentence Types (Condition One)

Type	RH	Linear Position of the Antecedent
I. SO	S>O	First NP (S)
II. GO	O>G	Second NP (O)
III. SG	S>G	First NP (S)

3.2.2.2. Condition Two

Additional test sentences were created by varying the relative order of the two third person NPs so that the sentence-initial NP is not always the antecedent in Types I and III. The literature suggests that the sentence-initial

NP is somehow prominent for younger children and that they often take it to be the agent or the actor (Bever 1970, De Villiers & de Villiers 1973, and Slobin 1982). It is therefore not impossible that the sentence-initial third person NP is so prominent for Korean children that at a certain stage they may use the following strategy.[3]

(1) First NP as Antecedent Strategy:

Interpret the sentence-initial third
person human NP as antecedent.

By varying the word order in the test sentences, we ensure that children using such a strategy would not accidentally succeed in interpreting the reflexive anaphor on this basis. This can be illustrated with the help of the SO type from Table 3.2 above.

(1) (Tom hit John in self's room.)

Tom-i John-ul caki-uy pang-eyse
Tom N John A self G room L

ttayri-ess-tta.
hit-Pt-Dc

In (1), the higher NP (thus antecedent) Tom is followed by John. As a result, the antecedent is the sentence-initial third person NP. However, by moving the object John to the beginning of the sentence, we can obtain a natural OSV structure with the same interpretation.

(2) (John, Tom hit in self's room.)

John-ul Tom-i caki-uy pang-eyse
John A Tom N self G room L

ttayri-ess-tta.
hit-Pt-Dc

Notice that in (2) the antecedent NP Tom is the second-mentioned NP. I will call this new construction OS in light of the fact that the first NP in the sentence is O and the second NP, S.

Along the same lines, we can construct a second set of structures involving S and G. The SG type repeated in (3) below involves a G *John's* contained in a prepositional phrase (PP) which is preceded by a subject NP *Tom*.

(3) (*Tom* touched, in John's room, *self*'s hat.)

Tom-i John-uy cip-eyse *caki*-uy moca-rul
Tom-N Mary-G home-L *self*-G hat-A

manci-ess-tta.
touch-Pt-Dc

By reversing the order of the PP *John's room* and the subject NP *Tom*, we can create the new construction in (4) which is semantically identical to and structurally as natural as (3).

(4) (In John's home, *Tom* touched *self*'s hat.)

John-uy cip-eyse *Tom*-i *caki*-uy moca-rul
John-G home-L *Tom*-N *self*-G hat-A

manci-ess-tta.
touch-Pt-Dc

The major difference between (3) and (4) relates to the position of the antecedent: in (4) the antecedent is the second NP. This new structure is named GS, since the genitive NP is followed by S.

In (3) and (4), the genitive NPs occur in a PP. However, a genitive can also occur in an argument NP as in (5) below.

(5) (Mary's friend saw self in a mirror.)

Mary-uy chinkwu-ka caki-rul kewul-lo
Mary-G friend-N self-A mirror-with

po-ass-tta.
see-Pt-Dc

The sentence type in (5) is named G_2S to indicate that the first third person NP Mary is contained in the larger NP Mary's friend which functions as S. The structures we have seen earlier, SG and GS, are now renamed as SG_1 and G_1S, in which G_1 designates a genitive element that is contained in a PP. Table 3.3 summarizes the six structure types from Conditions One and Two.[2]

Table 3.3

Test Sentence Types (Conditions One and Two)

	Type	RH	Linear Position of the Antecedent
I.	SO	S>O	First NP (S)
	OS	S>O	Second NP (S)
II.	GO	O>G	Second NP (O)
III.	SG_1	S>G	First NP (S)
	G_1S	S>G	Second NP (S)
	G_2S	S>G	Second NP (S)

Note: 'G_1' refers to a G occurring in a PP, 'G_2', a G contained in an NP.

3.2.2.3. Condition Three

As we saw in chapter two, the antecedent of the Korean reflexive can be either 'agent' or 'patient', depending on the structure. This is illustrated in (1) and (2).

(1) (Tom pushed John in self's home.)

Tom-i John-ul caki-uy cip-eyse mil-ess-tta.
Tom-N John-A self-G home-L push-Pt-Dc

(2) (John was pushed by Tom at self's home.)

John-i Tom-hanthey caki-uy cip-eyse
John-N Tom-by self-G home-L

mil-li-ess-tta.
push-PASS-Pt-Dc

In the active (1) the antecedent (Tom) is the agent while the antecedent in the passive (2) (i.e., John) is the person who was pushed (the patient). In Condition Three children's ability to interpret reflexives in active and passive constructions was studied. Two sentence types were used - the active construction in (1) (which is the same as SO in Table 3.3) and the passive construction (PASS) exemplified by (2), in which the antecedent of the reflexive is also the subject. Table 3.4 presents all seven sentence types used in my experiment.

Table 3.4

Test Sentence Types (Conditions One - Three)

	Type	RH	Linear Position of the Antecedent
I.	SO	S>O	First NP (S)
	OS	S>O	Second NP (S)
II.	GO	O>G	Second NP (O)
III.	SG_1	S>G	First NP (S)
	G_1S	S>G	Second NP (S)
	G_2S	S>G	Second NP (S)
IV.	PASS	S>Obl	First NP (S)

Note: 'G_1' refers to a G occurring in a PP, 'G_2', a G contained in an NP. 'Obl' is oblique.

In Table 3.5 below each type listed in Table 3.4 is exemplified. In the actual experiment, common Korean names were used in the place of Tom, John, etc. For the readers' convenience, however, I use English names throughout the thesis. Three tokens have been designed for each sentence type in my study (see Appendix I).

Table 3.5

Examples for Test Sentences

I. SO (Tom pushed John at self's home.)

Tom-i John-ul caki-uy cip-eyse mil-ess-tta.
Tom-N John-A self-G home-L push-Pt-Dc

OS (John, Tom pushed (John) at self's home.)

John-ul Tom-i caki-uy cip-eyse mil-ess-tta.
Mary-A Tom-N self-G home-L push-Pt-Dc

mil-ess-tta.
push-Pt-Dc

II. GO (I pushed the child's brother in self's home.)

Nay-ka iai-uy tongsayng-ul caki-uy
I-N the child-G brother-A self-G

cip-eyse mil-ess-tta.
home-L push-Pt-Dc

III. SG, (Tom saw, at Mary's home, self's friend.)

Tom-i Mary-uy cip-eyse caki-uy chinkwu-rul
Tom-N Mary-G home-L self-G friend-A

po-ass-tta.
see-Pt-Dc

G,S (At Mary's home Tom touched self's friend.)

Mary-uy cip-eyse Tom-i caki-uy chinkwu-rul
po-ass-tta.

G,S (Tom's brother bought self's hat.)

Tom-uy tongsayng-i caki-uy moca-rul
Tom-G brother-N self-G hat-A

sa-ass-tta.
buy-Pt-Dc

(-continued)

Table 3.5 (-continued).

IV. PASS (John was pushed by Tom at self's home.)

John-i Tom-hanthey caki-uy cip-eyse
John-N Tom-obl self-G home-L

mil-li-ess-tta.
push-PASS-Pt-Dc

3.2.3. Procedure (Question-Answer Comprehension Task)

3.2.3.1. Pretest

Prior to the actual experiment, each subject was led through the following three instructional steps. All subjects were interviewed separately in a quiet room.

(1) Each subject was introduced to four dolls (two boys and two girls). The Experimenter (E) made sure that the child could correctly identify the dolls by name.

(2) E gave the child a simple sentence (e.g., Mary is running etc.), and asked him/her questions like 'Who is running?' or 'What is Mary doing?,' etc. E made sure that the child understood the task before proceeding.

(3) E gave the child a simple sentence involving a third person NP and a

reflexive (e.g., Mary is chasing self's cat). E then asked the child questions such as Whose cat is it? to find out whether the child understood the meaning and the function of the reflexive pronoun.

None of the children had any difficulty with these questions.

3.2.3.2. Actual Test

Immediately following the pretest, children were given the comprehension test on which the study of forward anaphora was based. The procedure involved three steps.

(1) E placed three dolls together on a table, saying 'These children are playing together here.' E did not restate the dolls' names when presenting them, since it was thought that children might be biased by the order of names.

(2) E read a sentence with normal intonation and speed.

(3) E asked the subject several questions, the first of which always bore on the interpretation of caki. For example, after presenting a sentence like Tom pushed John in *self*'s room, E asked In whose room did it happen?. Other

questions (such as Who did the pushing? and 0 pushed who?) were then asked to determine whether children understood correctly the meaning of each sentence and the grammatical relations of third person NPs.

The whole procedure took approximately twenty minutes or a little less for each interview.

3.2.4. Scoring

Children's responses were divided into five different types, and were scored on the basis of a 1 - 5 scale established to assess the degree to which the responses were good or bad. The highest score 5 was given to the *absolutely correct* response, which indicated a full understanding of the test sentence, including the grammatical relation (GR) of the NPs and the correct interpretation of caki.[4]

The second highest score, a 4, was given to children who misinterpreted the GRs in the sentence but otherwise applied the Priority Condition (PRI) and the Relational Hierarchy (RH) in the appropriate way. For example, the OS type sentence in (1) was sometimes interpreted as SO, with John (rather than Tom) analyzed as subject of the verb pushed.

(1) (John, Tom pushed (John) at
self's home.)

John-ul Tom-i caki-uy cip-eyse mil-ess-tta.
John-A Tom-N self-G home-L push-Pt-Dc

Interestingly, many of the children who made this error also selected John (the NP which they thought was subject) as antecedent in accordance with the PRI. Since my study focusses on the child's sensitivity to the PRI, I gave this *pseudo-higher NP* response the second highest score 4.

A score of 3 was given to responses in which the children took the reflexive to be coreferential with a doll not mentioned in the test sentence but present in their field of vision. As noted above, each test sentence was preceded by the sentence These children are playing together, which was used to evoke a story-like setting. Each setting involved three dolls, two of which were actually mentioned in the test sentence, one remaining in the background. (I will refer to the name of this latter doll as the 'Background NP'.) While most subjects selected one of the overtly stated NPs as antecedent, a small number of children chose the *background NP*. This is, of course, not a correct choice since caki can normally refer to an NP in the previous context only if that phrase has been overtly mentioned. Nevertheless, I gave a score of 3 to these responses, taking into consideration the possibility that they indicate the child's sensitivity to the fact that the reflexive is not sentence bound. It is possible that for some children the pretest session functioned as a type of discourse context since during this session all four dolls were talked about until the subjects became familiar with their names.

A score of 2 was given to a response in which the Experimenter was selected as antecedent for the reflexive. In a GO type like (2), some children considered the antecedent to be I (i.e. the Experimenter who reads the sentence).

(2) (I pushed the child's friend at self's home.)

Nay-ka iai-uy chinkwu-rul caki-uy
I-N the child-G friend-A self-G

cip-eyse mil-ess-tta.
home-L push-Pt-Dc

While this *Experimenter-as-Antecedent* response is a wrong answer, since the Korean reflexive can only refer to a third person NP, I gave this pattern of response a score of 2.[5] This reflects the fact that while these children may not know the person requirement for the reflexive, they are sensitive to the PRI, since they regard the highest NP (the subject I) as antecedent.

Finally, *absolutely wrong* and *uninterpretable* responses were scored as 1. Such responses include any pattern which violates the PRI regardless of children's interpretation of the GRs in the sentence. To illustrate this type of error, I use the SO construction in (3) below.

(3) (John pushed Tom in self's room.)

John-i Tom-ul caki-uy pang-eyse mil-ess-tta.
John-N Tom-A self-G room-L push-Pt-Dc

In (3) John and Tom are S and O, respectively. Since John is higher than Tom, the former is the antecedent. Suppose that a child incorrectly interpreted the GRs of John and Tom by taking them to function O and S, respectively. If this child also chose as antecedent John (the lower NP (O) in his interpretation of the sentence), his response was categorized as 'absolutely wrong'.

The PRI can also be violated by children who correctly understood the GRs. For example, in the case of (3), a child could correctly interpret John and Tom as S and O, respectively, but select the O Tom (the lower NP) as antecedent. This is another violation of the PRI and was also regarded as 'absolutely wrong'. 'Uninterpretable' responses, on the other hand, are those in which children were reluctant, refused, or failed to provide responses. Table 3.6 below presents a summary of the scoring system that I have established so far.

Table 3.6

Scoring System

Antecedent	PRI	GR	Person	Endo	SCORE
Higher NP	C	C	C	C	5
Pseudo-Higher NP	C	I	C	C	4
Background NP	NA	C	C	I	3
Experimenter	C	C	I	C	2
Lower NP	I	I	C	C	1
Lower NP	I	C	C	C	1
Uninterpretable	NA	NA	NA	NA	1

Note: C=Correct, Endo=Endophoric (sentence-internal NP as antecedent), I=Incorrect, NA= Not Applicable

3.3. Results

3.3.1. Overall Performance

Figure 3.1 below presents the overall performance of the children on the seven types of forward structures.

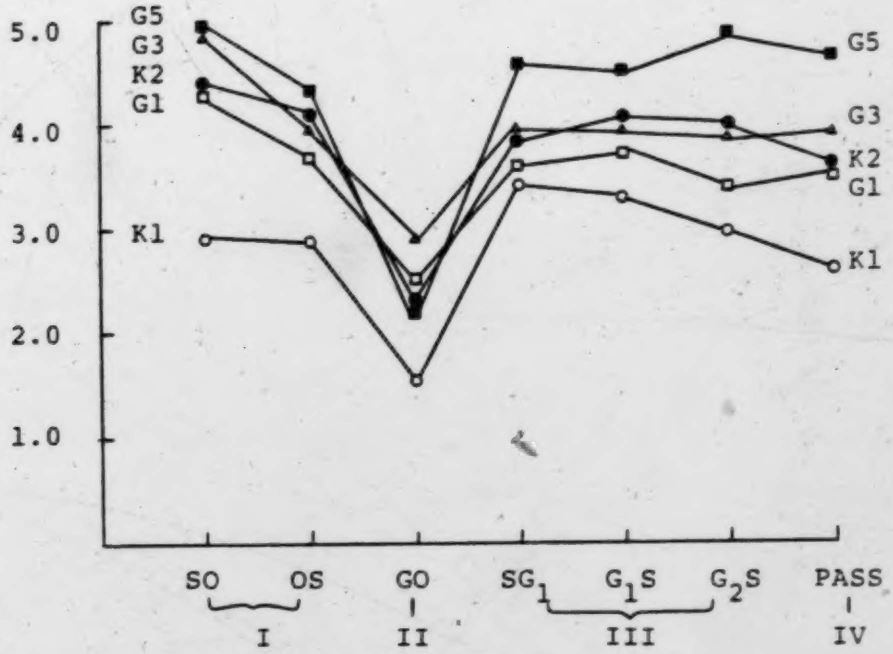


Figure 3.1

Overall Performance on Forward Anaphora

Age by Sentence Type Interaction

It is evident in Figure 3.1 that scores generally improved with age, and that all age groups obtained the lowest score on the GO type (II). The best scores were achieved on the SO (I) and SG types (III). A statistical test was performed with a factorial design by three-way analysis of variance (ANOVA): Age (A) x Subject (S) x Sentence Types (T). In this design, A and T were fixed, while S and replications (R) were random effects. Table 3.7 summarizes the outcome of the ANOVA test with respect to the main and interaction effects.

Table 3.7

Three-Way Analysis of Variance

Age (A) x Subject (S) x Sentence Types (T)
(Replications are nested in A, S, and T)

Source	Sum of Squares	D.F.	Mean Squares	F
A	312.576	4	78.1440	16.50**
T	369.065	6	61.5108	21.98**
S(A)	260.417	55	4.7348	2.27**
AT	79.490	24	3.3121	1.18
ST(A)	923.444	330	2.7983	1.34**
R(AST)	1754.000	84	2.0881	

Note: **P<0.001

As Table 3.7 shows, age was a significant factor (F(4,55)=16.50, P<0.001), as was sentence type (F(6,330)=21.98, P<0.001). There was no significant interaction effect between age and sentence type (F(24,330)=1.18, P=0.25).

3.3.2. Tukey Test for Sentence Types

The Tukey test was employed to test the difference of the cell means for sentence type. Means were ranked for the test and the ranks are represented in Figure 3.2.

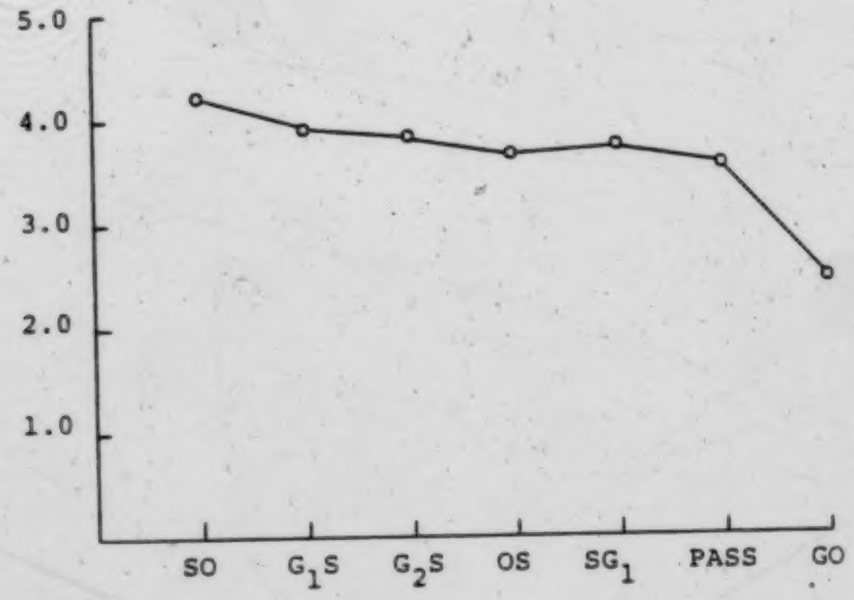


Figure 3.2

Mean Ranks Assigned to Sentence Types

The results of the Tukey test are found in Table 3.8.

Table 3.8

Tukey Test for Sentence Types

	SO	G_1S	G_2S	OS	SG_1	PASS	GO
SO	—	2.54	3.02	3.33	3.33	4.60*	14.50**
G_1S		—	0.48	0.71	0.79	2.06	11.98**
G_2S			—	0.32	0.32	1.59	11.51**
OS				—	0.08	1.27	11.20**
SG_1					—	1.27	11.20**
PASS						—	9.92**
GO							—

Note: Q_7=4.17 at $P<0.05$, Q_7=4.88 at $P<0.01$
*$P<0.05$, **$P<0.01$

As is evident in Table 3.8, there was no significant difference among the first five ranks (SO through SG_1). However, the mean of the GO type was significantly different ($p<0.01$) from all other constructions. Moreover, a significant difference ($p<0.05$) was found between SO (actives) and PASS (passives). The difference between actives and passives seems to result from the fact that children in K2-G3 age range performed very differently on the two structures. The relevant scores are represented in Table 3.9.

Table 3.9

Scores on Actives and Passives
(Total 5.0)

	Active	Passive
K1	2.8	2.7
K2	*4.3*	*3.5*
G1	*4.3*	*3.5*
G3	*4.9*	*3.9*
G5	4.9	4.6

Note: Numbers to be noted in my discussion are *Italicized* throughout this chapter.

We will provide a further analysis of the children's responses on these two sentence types in section 3.4.3 below.

3.3.3. Tukey Test for Age

Another Tukey test was conducted to examine the significance of the difference among the five age groups, whose mean scores for overall performance across sentence types are ranked in Figure 3.3.

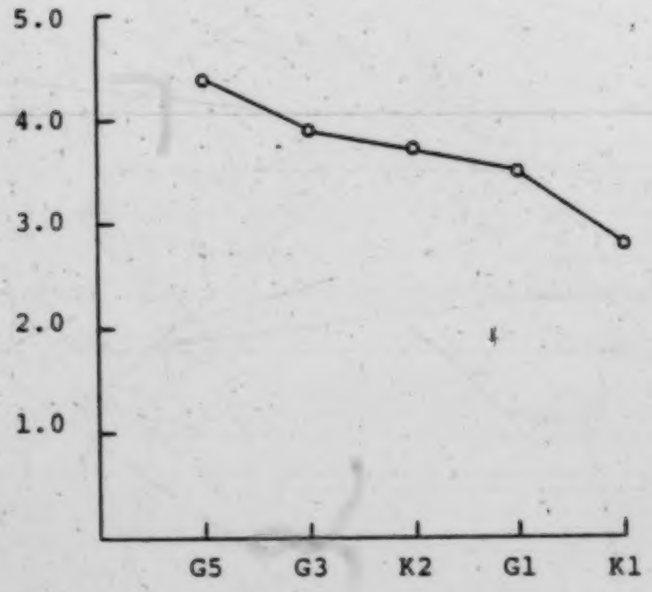


Figure 3.3

Mean Ranks Assigned to Age Groups

As Figure 3.3 indicates, scores increased significantly with developmental levels. Table 3.10 below summarizes the results of the Tukey test.

Table 3.10

Tukey Test for Age Groups

	K1	G1	K2	G3	G5
K1	—	5.33**	6.86**	7.74**	11.09**
G1		—	1.53	2.34	5.77**
K2			—	.88	4.23*
G3				—	3.43
G5					—

Note: Q,=3.86 at P<0.05, Q,=4.60 at P<0.01, *P<0.05, **P<0.01

Table 3.10 indicates that the performance of the G5 children is significantly different from that of the K1, K2 and G1 groups (P<0.05 or less). It should also be noted that the K1 scores were markedly different from those of all older groups (P<0.01).

3.3.4. An Alternative Statistical Analysis

The metrical problem that arises in connection with the above analysis, however, relates to the fact that the 1-5 scale represents qualitatively different responses, not a quantitatively different response measure along a single response parameter. Thus, a subject who scores 4 on one item and 2 on another cannot be logically equated with a second subject when he/she scores 3 on both items. In order to ensure that such a problem did not significantly affect the statistical results, an alternative analysis was performed.

The alternative analysis grouped together as correct the Higher NP and Pseudo-Higher NP responses and contrasted them with all the other response types. A two-way ANOVA was carried out and it was found that both age and sentence type were significant factors (Age ($F(4,24)=17.94$, $P<0.001$), Type ($F(6,24)=21.29$, $P<0.001$)). This, of course, corresponds to the results obtained from the previous analysis based on the 1-5 scale and indicates that the conclusions drawn from the prior analysis need not be changed.

3.4. Discussion

This section explores explanations for the performance of children on the forward anaphora structures. I will evaluate children's behaviour in detail, considering their use of strategies based on word order, semantic information and the pragmatic factor of 'empathy', as well as various syntactic factors.

3.4.1. Word Order and the Interpretation of NPs

The prominence of the sentence-initial NP to children is well known in the literature. De Villiers & de Villiers (1973:340), for example, note that younger English-speaking children tend to develop the so-called 'first NP as the agent' (FNA) strategy and therefore interpret a passive sentence like Tom was pushed by John as Tom pushed John. The FNA strategy, however, was not observed in my study, as shown by the data from the SO and OS types presented in Table 3.11.

Table 3.11

Percentage of Correct (C) and Incorrect (I) Interpretations of Grammatical Relations in SO and OS

	SO Type			OS Type		
	C	I	Other	C	I	Other
K1	56	39	6	39	45	17
K2	89	12	0	55	45	0
G1	83	17	0	42	58	0
G3	100	0	0	52	48	0
G5	92	8	0	45	56	0

Note: 'Other' = 'uninterpretable' responses

As is evident in Table 3.11, K1 showed no strong tendency to use the FNA strategy in interpreting SO and OS. That is, there was no strong preference in K1 to take either the first or the second NP to be the agent. Although the score for SO was slightly better than for OS (56% vs. 39%), the difference is trivial ($X^2=1.06$, $P>0.05$). Moreover, the FNA strategy cannot explain the behaviour of the older children in K2-G5 since they misinterpreted the OS type by taking the first NP as agent only 45%-58% of the time, although they were largely successful with the SO type (83%-100% correct).

I propose that this indicates that the older children rather make use of a principle involving both word order and case markers, as outlined in (1). (I take a 'nonembedded NP' to be one which does not occur within a larger NP. Hence, genitives are embedded NPs.)

(1) The Nominative NP as Agent Strategy (NNA):

If the first nonembedded NP has a nominative marker, it is agent.

The NNA predicts that the SO type will be correctly interpreted since the first nonembedded NP bears nominative case and is an agent. This strategy will not, however, help children to interpret the OS type because the nominative NP is not the first nonembedded NP in the sentence. In fact, as shown in Table 3.11, the K2-G5 groups were largely successful with the SO type (83%-100%), but seemed to be confused over the OS constructions on which they performed only at a chance level (42%-55% correct).

There is good reason to assume the NNA strategy is used in other languages as well. Recent studies have begun to note children's simultaneous sensitivity to both word order and case markers. Hakuta (1983:239), for example, reports on Japanese children's (aged 2;3-6;2) development of a strategy based on both variables. He notes:

> [Japanese children] seem to have a generalized scheme 'If the first noun of the sentence is marked by -ga [Japanese nominative marker], then it is the agent.'

As we shall see in Table 3.16 below, the G3-G5 children performed at a more mature level than the NNA strategy would predict. It was found that they largely succeeded (81%-95%) in interpreting active and passive constructions by taking the first nonembedded nominative NP to be subject regardless of its semantic role (agent, passive). On the basis of this, I suggest that these older children assume that if the first nonembedded NP has nominative case, then it is *subject*. (I will call this the *Nominative NP as Subject Strategy* (NNS). In (2) below, I summarize the strategies we have been considering.

(2) K1: No strategy

K2-G1: The NNA: If the first nonembedded NP is nominative, then it is agent.

G3-G5: The NNS: If the first nonembedded NP is nominative, then it is subject.

The NNA and NNS are further supported by the way in which children interpreted other structures involving S and G. Table 3.12 presents how children interpreted the grammatical relations of the G_2S constructions exemplified in (3).

(3) (The child's friend bought self's hat.)

iai-uy chinkwu-ka caki-uy moca-rul
the child-G friend-N self-G hat-A

sa-ass-tta.
buy-Pt-Dc

Table 3.12

Percentage of Correct (C) and Incorrect (I)
Interpretations of Grammatical Relations in G$_2$S

	C	I	Other
K1	42	44	14
K2	76	25	0
G1	84	14	2
G3	75	25	0
G5	94	6	0

Note: 'Other' category involves 'uninterpretable' responses.

As we can see in Table 3.12, the NNA strategy again did not seem to influence the behaviour of K1 children, who showed no preference for either the first NP (G) or the second NP (S) as agent (42% correct). The older children in K2-G5, on the other hand, performed far better, correctly comprehending the genitive and the nominative NPs 75%-94% of the time.

Let us now consider how children interpreted SG, and G,S, exemplified in (4) and (5), respectively.

(4) (Tom saw, at Mary's home, self's friend.)

Tom-i Mary-uy cip-eyse caki-uy chinkwu-rul
Tom-N Mary-A home-L self-G friend-A

po-ass-tta.
see-Pt-Dc.

(5) (At Mary's home, Tom touched self's friend.)

Mary-uy cip-eyse Tom-i caki-uy chinkwu-rul
Mary-G home-L Tom-N self-G friend-A

po-ass-tta.
see-Pt-Dc

The relevant information is presented in Table 3.13.

Table 3.13

Percentage of Correct (C) and Incorrect (I) Interpretations of Grammatical Relations in SG, and G,S

	SG,			G,S		
	C	I	Others	C	I	Others
K1	67	28	6	67	25	8
K2	73	28	0	87	14	0
G1	97	3	0	81	14	6
G3	95	0	6	87	12	3
G5	100	0	0	97	3	0

Note: 'Other' = uninterpretable responses

As is evident in this table, all the children performed quite well on the two structures under consideration. This supports the claim that if the first nonembedded NP in the sentence has nominative case, it will be interpreted as either agent or subject (depending on the child's level of development).

3.4.2. Word Order and the Interpretation of caki

In the present section we will consider the question of whether children's interpretation of the reflexive caki can be characterized in terms of processing strategies. To begin with, let us examine whether children employed the 'First NP as antecedent' strategy outlined in (1).

(1) First NP as Antecedent of the Reflexive (FAR):

Take the first NP as the antecedent of the reflexive caki.

Note that in SO and SG, structures, the antecedent is the *first* NP (column I in Table 3.14). In the OS, G,S, and G,S structures, in contrast, the *second* animate NP functions as antecedent (column II). Table 3.14 shows the scores obtained on these five structures.

Table 3.14

Interpretation of caki in SO and SG_1
(Total Score 5.0 for Each Cell)

	I. First NP=Antecedent		II. Second NP=Antecedent		
	SO	SG_1	OS	G_1S	G_2S
K1	2.8	3.4	2.8	3.3	3.0
K2	4.3	3.8	4.1	4.1	4.0
G1	4.3	3.6	3.7	3.7	3.4
G3	4.9	3.7	4.0	3.9	3.8
G5	4.9	4.6	4.3	4.5	4.9
Mean	4.2	3.8	3.8	3.9	3.9

The difference between the scores in columns I and II in Table 3.14 is minimal. In fact, no significant difference was found among the five types involved here, as we saw in our earlier discussion of the Tukey test (Section 3.3.2). This suggests that the linear position of potential antecedents did not significantly affect the way in which children interpreted caki. In other words, there was no significant tendency for children to prefer the first or second NP as antecedent. Rather, the children - particularly those in the older groups (K2-G5) - generally behaved in conformity with the Priority Condition (PRI), obtaining a relatively high score on all types (3.4-4.9).

One might argue, of course, that it is still possible to explain the scores in Table 3.14 in terms of a strategy such as 'First Argument as Antecedent of the Reflexive (FAAR)' outlined in (2) below.

(2) First Argument as Antecedent of the Reflexive (FAAR):

Take the first argument as the antecedent of the reflexive caki.

This does not appear to be an unreasonable assumption at first glance since in all structures except OS the first argument is antecedent. In fact, the OS type will be our crucial case to test the adequacy of the FAAR since in it the *second* argument (S) is the antecedent. The FAAR would be confirmed if children correctly interpreted the grammatical relation (GR) of NPs in the OS structure, but mistakenly took the *first* argument (O) as the antecedent in compliance with the FAAR strategy. The relevant data are found in Table 3.14 below, which presents the distribution of responses pertaining to the correctness of the GR and the Priority Condition (PRI).

Table 3.15

Percentage of Correct (C) and Incorrect (I) Interpretations of OS

GR / PRI	C			I		Other
	C	I		C	I	
Antecedent:	Second NP (S)	First NP (O)		First NP (S)	Second NP (O)	
K1	25	14	(=39)	31	14	17
K2	47	8	(=55)	42	3	0
G1	31	11	(=42)	50	8	0
G3	44	8	(=52)	42	6	0
G5	42	3	(=45)	56	0	0
Mean	38 (38/47=81%)	9 (9/47=19%)	(=47)	44	6	3

Note: 'Incorrect' responses of GR are those in which OS structures were interpreted as SO; 'Other' category involves 'uninterpretable' responses Background NP, and Experimenter-as Antecedent Responses. The numbers in the parentheses are subtotals of the first two columns

The data in the first two columns is relevant to the question of whether children chose the first argument as antecedent, as the FAAR predicts, even when they correctly interpreted the GR of the NPs in OS structures. Our scores clearly suggest that this strategy was not used. In particular, the children in K2-G5 who correctly comprehended the GR took the *second* NP (S) as antecedent 81% of the time on the average (see the bottom line of the first column) as the PRI would predict. This suggests that these older children made use of a richer system than just the FAAR strategy, and leads us to conclude that this strategy was not used by children.

This is further confirmed by the way in which children interpreted caki in actives and passives. Table 3.16 indicates how often children correctly interpreted the GR of third person NPs in active and passive constructions.

Table 3.16

Percentage of Correct (C) and Incorrect (I)
Interpretation of the Grammatical Relation in
Actives and Passives

	Actives			Passives		
GR	C	I	Other	C	I	Other
K1	56	39	6	14	67	19
K2	83	12	6	31	67	3
G1	80	17	3	41	58	0
G3	100	0	0	81	19	0
G5	92	8	0	95	6	0

In Table 3.16 it is clear that passives were largely misinterpreted as actives by younger children in K1-G1, who achieved success rates of only 14%-31%, while G3-G5 groups performed much more successfully (81%-95% correct).

Actives, on the other hand, were comprehended correctly by most of the older children in K2-G5 (80%-100% correct). The misinterpretation of the passives by younger children is very unfortunate for my purposes, because it makes it difficult to determine how they treated a subject which is semantically a patient in their interpretation of caki.

Let us examine the degree to which the PRI was followed in children's interpretation of caki for actives and passives in Tables 3.17 and 3.18, respectively.

Table 3.17

Percentage of Correct (C) and Incorrect (I) Interpretations of caki in Actives (SO)

GR	C			I (SO as OS)		
PRI Antecedent	C Agent	I Patient		C Agent	I Patient	Other
K1	31	25	(=56)	28	11	6
K2	75	8	(=83)	6	6	6
G1	69	11	(=80)	14	3	3
G3	97	3	(=100)	0	0	0
G5	92	0	(=92)	8	0	0

Note: The numbers in the parentheses are subtotals for the first two columns; GR=Grammatical Relation, PRI=Priority Condition

In Table 3.17, we can see that the children in K2-G5 correctly interpreted the GRs of third person NPs and caki 69%-100% of the time (see the first and the third parenthesized columns). Now let us compare the results above with the children's performance on passives in Table 3.18 below.

Table 3.18

Percentage of Correct (C) and Incorrect (I) Interpretations of caki in Passives (S/Obl)

GR	C			I			
PRI Antecedent	C Patient (Subject)	I Agent		C Agent (Subject)	I Patient		Other
K1	8	6	(=14)	42	25	(=67)	19
K2	17	14	(=31)	61	6	(=67)	3
G1	33	8	(=41)	39	19	(=58)	0
G3	67	14	(=81)	8	11	(=19)	0
G5	89	6	(=95)	3	3	(=6)	0

Note: 'Incorrect' responses involve passives interpreted as actives; 'Other' responses are those where background NP or the experimenter was taken as antecednet, or uninterpretable cases. The numbers in the parentheses are subtotals for the first two columns and the second two columns separately.

In the fourth and fifth columns (under GR:I) of Table 3.18, we can see that while many younger children (K1-K2) misinterpreted passives as actives, they exhibited a strong tendency to take the NP which they interpreted as subject to be antecedent, thus complying with the PRI (42%-61% out of 67%).

The behaviour of the older children (G3-G5) is in sharp contrast with that of the younger children. Not only did older children very often succeed in comprehending passives (81%-95% of the time, as noted in the third column), but they also generally interpreted the reflexive correctly by taking the patient subject as antecedent (67%-89% of the time). Comparable behaviour was observed in the G1 children, whose correct responses to passives are much less frequent than those of the G3-G5 children, yet nevertheless largely satisfy the PRI (33% out of 41%). These findings are important since they clearly suggest that the successful older children know that either the patient or the agent can function as antecedent for the reflexive when it is subject.

3.4.3. Pragmatics ('Empathy') and the GO Type

As we saw in 3.3.1, children of all age groups scored lowest on the GO construction exemplified in (1) below.

(1) (I pushed the child's brother at self's home.)

Nay-ka	iai-uy	tongsayng-ul	caki-uy
I-N	the child-G	brother-A	self-G

cip-eyse	mil-ess-tta.
home-L	push-Pt-Dc

In (1), the object (O) is higher in the relational hierarchy than the genitive (G), and thus must be the antecedent of the reflexive. However, a large number of children incorrectly chose G or the Experimenter (the subject I) as the antecedent. In this section I explore the possibility that these errors are due to the discourse factor of empathy.

Table 3.19 indicates how often the Priority Condition (PRI) was exploited in children's interpretation of reflexives in GO structures. I include as correct cases in which children misinterpret GRs, but then interpret the sentence in accordance with the PRI.

Table 3.19

Percentage of Correct (C) and Incorrect (I)
Interpretations of caki in GO

PRI	C	I		Other
Antecedent	O	G	E	
K1	17	75	0	8
K2	39	53	0	8
G1	45	52	0	3
G3	42	31	17	11
G5	28	33	39	0

Note: C=Correct, E=Experimenter, I=Incorrect, O=Object, Other=Uninterpretable and Background NP responses, G=Genitive

Note in Table 3.19 that the dominant error in K1-G1 was the choice of G (52%-75%) as antecedent. The older children, on the other hand, made two different kinds of errors - G as antecedent (31%-33%) and the E (Experimenter) as antecedent (17%-39%). A closer look at the performance of the G3 and G5 children revealed that eight out of the twenty-four contributed to the relatively high scores for E: three of the twelve children in G3 and five of the twelve children in G5 chose the Experimenter as antecedent - 67% and 93% of the time, respectively. Another analysis was conducted in which these eight children were excluded. The slightly different results represented in Table 3.20 were obtained.

Table 3.20

Percentage of Correct (C) and Incorrect (I) Interpretations of caki in GO (Eight Strategy Children Excluded)

PRI Antecedent	C O	I G	Other
K1	17	75	8
K2	39	53	8
G1	45	52	3
G3	48	37	15
G5	43	57	0

Note: C=Correct, I=Incorrect, O=Object, G=Genitive
Other=Uninterpretable, Background NP responses

Table 3.20 contains slightly higher scores for G3 and G5 than Table 3.19 (43-50% vs. 28-42%). However, there is still a large number of responses (37%-57%) in which the lower NP (G) was incorrectly regarded as antecedent. This raises a question as to the source of these incorrect responses. I make an attempt here to give an account involving the notion of 'empathy' developed by Kuno & Kaburaki (K&K) (1977:628). They defined 'empathy' as follows.[4]

(1) Empathy:

> Empathy is the speaker's identification, with varying degrees (ranging from degree 0 to 1), with a person who participates in the event that he describes in a sentence.

As an illustration of this, observe (2)-(3) below.

(2) Mary's husband hit her.

(3) I talked to Mary's husband about her.

According to K&K (ibid.:627-629), in (2) the speaker 'completely empathizes' (identification to degree 1) with Mary rather than with Mary's husband (say, John) because the speaker has referred to Mary as Mary, and to John as Mary's husband. Thus, the following empathy hierarchy is established.

(2') 1. Mary
2. Mary's husband

In (3), on the other hand, the speaker's empathy with Mary 'cannot be to degree 1 since he is expressing his own action.' Thus, in this case, the following empathy relationship holds.

(3') 1. I
     2. Mary
     3. Mary's husband

Notice that the GO construction used in my study has the same basic structure as (3). Very interestingly, the empathy relationship outlined in (3') above coincides with the way in which Korean children incorrectly interpreted the reflexive in the GO construction. Recall that children in K1-G1 mistakenly selected the second highest NP in (3'), the genitive element, as antecedent 52%-75% of the time and that the G3-G5 children alternately chose one of the highest two NPs in (3') - the genitive (31%-33% of the time) and the subject NP I (17%-39% of the time) (see Table 3.19). On the basis of this finding, we may posit the hypothesis in (4).[7]

(4) Empathy Hierarchy and *caki* in Children:

Children prefer higher NPs in the Empathy Hierarchy as the antecedent of the reflexive.

Significantly, however, children did not use the principle in (4) for all sentence types. The G_2S structure exemplified in (5) below is a case in point.

(5) (Mary's friend saw self in a mirror.)

Mary-uy chinkwu-ka	caki-rul	kewul-lo
Mary-G friend-N	self-A	mirror-with

po-ass-tta.
see-Pt-Dc

Note that, if K&K (ibid.) are correct, the empathy relationship that holds in (5) can be represented as (5').

(5') 1. Mary
     2. Mary's friend

If children had employed the strategy described in (4) for the G,S structure, they would have chosen the higher NP in the empathy hierarchy (i.e., Mary) as antecedent. However, this did not happen. Rather most children correctly interpreted the reflexive in the G,S type by choosing the subject Mary's friend which is lower in the empathy hierarchy (5'), but highest in the relational hierarchy (scores here ranged from 3.4 to 4.9 out of total score 5.0, see Figure 3.1).

It may well be the case that children rely on the constraint in (4) only when their grammatical knowledge is inadequate or unclear. That is, the strong effect of 'empathy' on the GO type may stem from the fact that children have not yet developed the portion of the relational hierarchy which stipulates that O is higher than G, although they do know that S is higher than either O or G. Consistent with this proposal, we find that discourse strategy (4) did not manifest itself in the children's interpretation of the G,S structure, as we would have expected if children knew that S was higher than G in the relational hierarchy.

3.4.4. Development of Grammatical Principles

In sections 3.4.2 and 3.4.3, I noted that older children's performance cannot be explained solely in terms of strategies based on word order, semantic roles or pragmatic information alone. I suggested that older children draw on grammatical knowledge (i.e., grammatical relations) in interpreting reflexives and that this knowledge overrides processing strategies and empathy considerations. In this section, I draw on the experimental findings reported earlier to characterize how this linguistic knowledge seems to develop in children.

As we saw in section 3.3, the ANOVA test indicates that age was a significant factor in children's performance on our test sentences. Moreover, the Tukey test showed that the performance of the K1 children was significantly different from that of all older groups, while the behaviour of the G5 children was also markedly different from that of younger groups such as K1-G1. The K1 children, in particular, seemed to perform without discriminating among any sentence types, obtaining fairly low scores across the board. On the other hand, we have seen that older children (G3-G5) succeeding in many of the SO and SG structures, while failing on the GO construction. In light of this, I hypothesize that development of the hierarchy has taken place in accordance with the following stages as in (1) and that children have a principle resembling (2).

(1) Stage 1. No grammatical principle (K1)
Stage 2. S > ..O..G.. (K2-G3)
Stage 3. S > O > G (G5)

(2) Choose the highest NP as the antecedent.

According to (1), children initially have no grammatical principle for interpreting reflexives and therefore exhibit the near random behaviour found in K1. They then develop the hypothesis that S is higher than either O or G, thereby correctly interpreting the SO and SG constructions. However, since the status of G and O with respect to each other is not yet established, the GO structures create problems and children revert to the empathy strategy described above.

Because of the large number of errors involving the choice of G or the Experimenter as antecedent in the GO structures, the evidence from forward anaphora is not sufficient to demonstrate that the G5 children have actually the full hierarchy associated with Stage 3. However, the existence of this stage is supported by the children's behaviour on backward anaphora, which will be further discussed in chapter four.

3.5. Other Studies

The evidence we have just observed indicated that the 'subject' is easiest for children to link a reflexive pronoun with a subject than with any other NP. Recently, comparable results have been obtained in other studies. Otsu (1981), for example, studied the performance of sixty English-speaking children at 3;1-7;1 on structures like (1) in an act-out task.

(1) The elephant near the hippo tickled himself.

In this study, it was found that from age 4;0, children showed a strong tendency (71%-83% of the time) to choose subject NPs as antecedent.

Moreover, Suzuki (1985) tested sixty Japanese- speaking children on SO types (*Tom* pushed John in *self*'s room) using an act-out task. She reports that even the youngest group (age 4;0) correctly chose subjects over objects as antecedent 76% of the time. Older children succeeded 81%-100% of the time.' These findings clearly point to children's early sensitivity to the role of the subject in the interpretation of reflexives, and support Harada's (1976:9) observation that:'

> ...when a rule is applicable to either subjects or nonsubjects, its application to subjects is easier to process in sentence...and appears earlier in child language.

3.6. Summary and Conclusion

This chapter has examined the way in which children interpreted the reflexive pronoun *caki* in forward anaphora constructions. It was found that the status of S with respect to O or G developed earlier than the relationship of O to G. Children's hypotheses based on word order, semantic information and 'empathy' have also been examined. It was concluded that the children seemed to believe that the nominative marked NP is agent (K2-G1) or subject (G3-G5). Significantly, however, word order and semantic information play no direct role in the children's (K2-G5) interpretation of the reflexive. The older children in

G3-G5, in particular, largely succeeded in interpreting the reflexive pronoun regardless of the semantic role or relative linear position of its antecedent. Some of G1 children were also observed to behave like G3-G5 groups. It was therefore concluded that at least the successful children in G1-G5 were probably developing the grammatical mechanisms found in the adult system.

The pragmatic notion of 'empathy' was also found to play an apparent role in explaining why children produced errors involving the selection of the Experimenter or a genitive as antecedent in the GO type. However, since children were more dependent on the Priority Condition rather than the Empathy Hierarchy in their interpretations of the G_2S type, it was concluded that grammatical knowledge, once acquired, overrides pragmatic principles.

Notes to Chapter 3

1. I consider the genitive to be 'first NP' in the sense that it is contained within the larger object NP.

2. See Footnote 1.

3. 'Strategy' in my thesis refers to a device in linguistic performance motivated in part, at least, by processing considerations such as memory limitations or psychological searches. It is to be distinguished from a grammatical principle or rule which makes reference only to syntactic notions such as subject, NP, etc. Thus, the Priority Condition is a syntactic principle, but the Recency Strategy which refers to the processing notion 'recency' is a strategy.

4. I am very grateful to Dr. John Hogan who kindly provided me with valuable suggestions on the basis of which I established the scoring system I adopted for the analysis used in chapter three.

5. In some dialects, caki may be used to refer to the listener if he or she is on highly intimate terms with the speaker. My dialect does not allow this use of caki.

6. Susumu Kuno (personal communication) points out that the empathy hierarchy is intended to apply only to sentences which are used in a discourse.

7. The processing constraint in (4) presupposes that children are sensitive to the 'empathy' relationship before their grammatical knowledge emerges. While this may be a controversial assumption, I know of no studies investigating this issue and will thus leave it open to be further explored in the future.

8. Japanese children's early success in the selection of an antecedent may result from the fact that in Japanese only the subject can serve as antecedent in cases of intrasentential anaphora.

9. The control group consisting of eight university students also seemed to find subject-antecedent structures easier to interpret than object-antecedent cases (97% vs. 81%).

CHAPTER 4

THE DEVELOPMENT OF BACKWARD ANAPHORA

4.0. Preface

Chapter three was concerned with children's interpretation of forward constructions, each of which contains two third person NPs preceding the reflexive. The present chapter discusses how children interpret the reflexive pronoun in cases where it precedes a third person noun phrase (NP) ('backward anaphora'). As was noted in chapter two (2.1.2), it is assumed here that the Precedence Constraint governs the anaphoric relationship that holds between the reflexive and a following antecedent. This syntactic constraint is briefly reviewed in Section 4.1 below.

4.1. The Precedence Constraint

As we saw in chapter two, the Precedence Constraint (PC) is based on two conditions in (1') below.

(1) Precedence Constraint (PC) :

An argument pronoun can only precede a higher antecedent.

(1') a. Coreference is allowed in the backward pattern when the antecedent is higher than the anaphor.

b. When the antecedent and the anaphor
are equal in rank, coreference is
allowed only when the reflexive is
a genitive (nonargument).

In studying the development of backward anaphora, I will limit my discussion to the 'S>(D)O>G' portion of the hierarchy in (2) and to the special case of the PC stated in (1'a) which I will call 'Distinct Rank Condition (DRC)'.

(2) Relational Hierarchy (RH):

S	>	DO	>	G
T		IO		Embedded NPs

In summary, then, the following mechanisms are relevant to my experiment on backward anaphora.

(3) a. S > O > G

b. Distinct Rank Condition (DRC):

Coreference is allowed when the
antecedent is higher than the
reflexive.

The sentence types outlined in Table 4.1 below are relevant to my experiment.

Table 4.1

Coreference Conditions for Backward Anaphora

I. *Free Backward*

OS Type: caki (O) < NP (S)
GO Type: caki (G) < NP (O)

II. *Blocked Backward*

SO Type: *caki (S) > NP (O)
OG Type: *caki (O) > NP (G)

Note: Each type is named after the order of the grammatical relations borne by caki and NP. Thus in the 'OS Type', for example, caki is O and is followed by an NP which functions as S.

Although chapter two (2.1.2) deals in detail with the PC, I will briefly review here how this constraint explains the Korean backward anaphora. Take, for example, a free backward construction like (3) below which allows the reflexive to be coreferential with either an intra- or extra-sentential NP.

(3) (Yesterday self, Tom saw.)

Ecey	caki-rul	Tom-i	po-ass-tta.
yesterday	self-A	Tom-N	see-Pt-Dc

In (3) the reflexive pronoun caki precedes a *higher* NP since the former is direct object and the latter subject. The DRC (more generally, the PC) is therefore maintained and coreference is allowed.

Let us now look at a blocked backward structure like (4), which prohibits coreference between the reflexive and an NP in the same sentence.

(4) (Yesterday self saw Tom.)

*Ecey caki-ka Tom-ul po-ass-tta.
yesterday self-N Tom-A see-Pt-Dc

Notice that in (4) the reflexive pronoun precedes a *lower* antecedent, since caki here is the subject and Tom direct object. The DRC has therefore been violated and the principle correctly predicts that caki cannot refer to Tom.

4.2. Purpose

The present experiment inquires into (1) how children's interpretation of backward anaphora is affected by the presence of a context, (2) how this effect interacts with the child's processing strategies and the Distinct Rank Condition, and (3) whether context affects children differently at different age levels. As we shall see shortly, two experiments were designed for this study. In the first, each target sentence was presented to a child in a *neutral* type of context containing no third person NPs (thus no eligible antecedents). In the second experiment, on the other hand, there was a *controlled* context in which a third person singular NP functioned as discourse topic.

4.3. Method

4.3.1. Subjects

Each experiment made use of a separate group of sixty children. These children were selected from those who were thought to be at an average academic level and came from middle class families in Seoul, Korea. Within each group there were five age levels, each of which consisted of twelve children. The mean age and the age range for each group are shown in Tables 4.2 and 4.3 below.

Table 4.2

Subjects: Experiment One (Neutral Context)

Age Level		Age Range	Mean Age
Kindergarten 1	(K1)	4;1 - 4;11	4;6
Kindergarten 2	(K2)	5;3 - 6;2	5;8
Grade 1	(G1)	6;8 - 7;6	7;1
Grade 3	(G3)	8;7 - 9;7	9;1
Grade 5	(G5)	10;7 -11;7	11;2

Table 4.3

Subjects: Experiment Two (Topic Context)

Age Level	Age Range	Mean Age
K1	3;9 - 5;5	4;7
K2	5;2 - 6;5	5;8
G1	6;9 - 7;4	7;1
G3	8;8 - 9;7	9;2
G5	10;5 -11;5	10;9

4.3.2. Linguistic Materials

4.3.2.1. Test Sentences

All test sentences were constructed on the basis of the coreference conditions which are crucial for testing knowledge of the 'Distinct Rank Condition' (Table 4.1). In addition to the backward constructions illustrated above, a variety of forward patterns of coreference were also tested, as noted below. The need for such structures arises in cases where a blocked backward sentence like (1b) below is used in the context (1a), where John is topicalized.

(1) a. (As for John, (he) is in our class.)
John-un wuri pan-ey isse-yo.
John-T our class-L is-Dc

b. (Earlier, self hit Tom.)
*Akka caki-ka Tom-ul ttayri-ess-yo.
earlier self-N Tom-A hit-Pt-Dc

The problem here is that even a correct response by the children need not entail knowledge of the grammatical principle for backward anaphora, since it is possible that children simply favour discourse topics regardless of the acceptability of the intrasentential antecedents.

It is therefore important to find out whether children rely on a discourse topic in selecting an antecedent regardless of structural differences among types. Since the reflexive pronoun in forward patterns such as (2) can naturally take either an intrasentential NP or a discourse topic as antecedent, this structure was used as the baseline against which to assess children's interpretation of backward cases.

(2) (Tom saw self in a photo.)

Tom-i caki-rul sacin-eyse po-ass-tta.
Tom-N self-A photo-in see-Pt-Dc

Forward constructions were devised on the basis of the conditions described in Table 4.4(III) below. Notice that unlike backward types, the anaphor now follows a third person NP. For each type listed in Table 4.4, three tokens were invented. Thus for backward and forward cases together, eighteen sentences were made up for this study (see Appendix II). The same set of eighteen constructions were used in both experiments.

Table 4.4

Coreference Conditions for Forward and Backward Anaphora

I. *Free Backward (B)*

OS Type: caki (O) < NP (S)
GO Type: caki (G) < NP (O)

II. *Blocked Backward (*B)*

SO Type: *caki (S) > NP (O)
OG Type: *caki (O) > NP (G)

III. *Forward (F)*

SO Type: NP (S) > caki (O)
OG Type: NP (O) > caki (G)

These six types of constructions are exemplified in

Table 4.5 below.

Table 4.5

Examples of Backward and Forward Anaphora Types

I. B(OS): (Self, Tom hit.)

Caki-rul Tom-i ttayri-ess-tta.
self-A Tom-N hit-Pt-Dc

B(GO): (I, at self's home, hit Tom.)

Nay-ka caki-uy cip-eyse Tom-ul mil-ess-tta.
I-N self-G home-L Tom-A push-Pt-Dc

II. *B(SO): (Self hit Tom.)

*Caki-ka Tom-ul ttayri-ess-tta.
self-N Tom-A hit-Pt-Dc

*B(OG): (I hit self, at Tom's home.)

*Nay-ka caki-rul Tom-uy cip-eyse mil-ess-tta.
I-N self-A Tom-G home-L push-Pt-Dc

III. F(SO): (Tom drew self.)

Tom-i caki-rul kuri-ess-tta.
Tom-N self-A draw-Pt-Dc

F(OG): (I pushed Tom at self's home.)

Nay-ka Tom-ul caki-uy cip-eyse mil-ess-tta.
I-N Tom-A self-G home-L push-Pt-Dc

4.3.2.2. Context

As was indicated earlier, two different kinds of contexts were designed for this study.

A. Neutral Context

In this experiment each test sentence was preceded by a context which was 'neutral' in that it does not contain any eligible (third person singular) antecedents. The sentence (to be called the 'Neutral Context') was 'These children are now playing together' as in (1) below. (Note that the subject these children is not an eligible antecedent since caki can refer only to a *singular* third person NP.) This sentence was given before each test sentence while the Experimenter displayed three dolls whose names had been taught to the children in advance. (The three dolls presented at each setting will be called 'background dolls'.)

(1) Neutral Context (Experiment One)

(These children are now playing together.)

I	aitul-i	cikum	nol-koise-yo.
these	children	now	play-Pr-Dc

As is evident in (1), the setting contains no overt third person proper nouns (names) and therefore simply provides a type of background information.

One major reason for providing such a setting is to avoid a situation in which the children heard test sentences, many of which contain the reflexive pronoun in initial position (e.g., backward anaphora). It was thought that asking younger children about isolated sentences with an utterance-initial anaphor could create an unusual situation which might then decrease their chances of correctly interpreting the stimuli.

Another reason for using the background setting was to provide children with options to consider in choosing an antecedent. Although the neutral context does not contain any specific eligible antecedents, the background dolls provide potential referents for caki, particularly in the case of blocked intrasentential anaphora.

B. Topic Context

The second experiment involved a context containing an overtly stated topic NP. I will call this the 'topic context' as compared to the 'neutral context'. Each topic context consisted of two simple sentences and three 'background dolls'. The first sentence (e.g., (1a) below) provided information about someone who is 'topicalized', whose name I will call the 'discourse topic'. (Four different topics were used in this experiment.) This sentence was then immediately followed by another so-called 'distractor' (1b) which was the same throughout the experiment and stated that '(Discourse Topic) is now playing with these children,' referring to the two other dolls that were present. The distractor did not actually repeat the discourse topic since this element occurs as a null pronoun in this structure in Korean. Thus the topic was mentioned overtly only once in each discourse context in this experiment. The example in (1) below illustrates the topic context designed for this experiment.

(1) Topic Context (Experiment Two)

a. Discourse Topic

(As for Tom, (he) is my friend.)

Tom-un	na-uy	chinkwu-ey-yo.
Tom-T	I-G	friend-be-Dc

b. Distractor

((He) is now playing with these children.)

Ø	Cikum	i	aitul-hako
Ø	now	these	children-with

nolko-isse-yo.
play-Pr-Dc

Note: The NPs within parentheses are null in the Korean sentence.

4.3.3. Procedure

4.3.3.1. Pretest

Before the actual study began, a pretest was given to each child. In it, the experimenter (E) gave each child a simple sentence like Tom cried in self's room and asked questions (Q) such as Where did Tom cry?, Who cried?, etc. This was done for several reasons. For one thing, it was necessary for the children to learn the names of the four dolls which are used throughout the experiment. The session was also intended to help the children become familiar with the question-answer comprehension task employed in the actual study. The pretest also gave the E an opportunity to make sure that each child knew the meaning and the function of the reflexive pronoun.

4.3.3.2. Actual Test

The procedure in the actual test was as follows.

(a) The E placed three dolls on a table and said 'Now, I am going to tell you a story. I would like you to listen to me very carefully and answer my questions.'

(b) The E read the contextual information ('neutral context' (NC) for Experiment One and 'topic context' (TC) for Experiment Two), and then gave the child a test sentence (TS).

(c) The E then asked the child questions about the TS, the first of which was always relevant to the interpretation of the reflexive since this was the major concern of the study. The E also asked follow-up questions which bore on the general meaning of the TS to find out whether the child properly understood the grammatical and semantic relations of the various NPs in the test sentences.

The entire procedure (which took approximately twenty minutes or less) was, of course, carried out in Korean, and common Korean names were used in the place of *Tom, John,* etc. For the readers' convenience, however, English names are used in the example given here. The entire procedure is outlined in English as (1) below.

(1) a. Experiment One:

NC: (Showing three dolls) the E says, 'These children are playing together.'

TS: *Self hit Tom yesterday.

Q: Who did the hitting?
When did it happen?
etc.

b. Experiment Two

TC: (Showing three dolls) the E says, 'As for Tom, (he) likes skating. (He) is now playing with these children.'

TS: *This morning self hit Mary.

Q: Who did the hitting?
When did it occur?
etc.

4.3.4. Assessment of Children's Responses

Children's responses are evaluated in terms of 'type' rather than 'right' or 'wrong'. Free backward structures, in fact, do not allow errors since, as was noted earlier in chapter two (2.2.3), the reflexive can permit either a sentence-internal or a sentence-external anaphor. On the other hand, children can err in interpreting blocked backward constructions (by taking the postjacent intra-sentential NP as the antecedent). Since a correct-incorrect scoring system would obviously be misleading for responses involving the free backward anaphora, it was abandoned in the present study. Instead, children's responses were classified according to whether the NP they took as antecedent was *endophoric* (sentence-internal) or *exophoric* (sentence-external).

4.4. Results

4.4.1. Experiment One ('Neutral Context')

Table 4.6 below indicates how often children responded with an exophoric interpretation (involving a background doll) in cases of free backward (B) and blocked backward (*B) anaphora.

Table 4.6

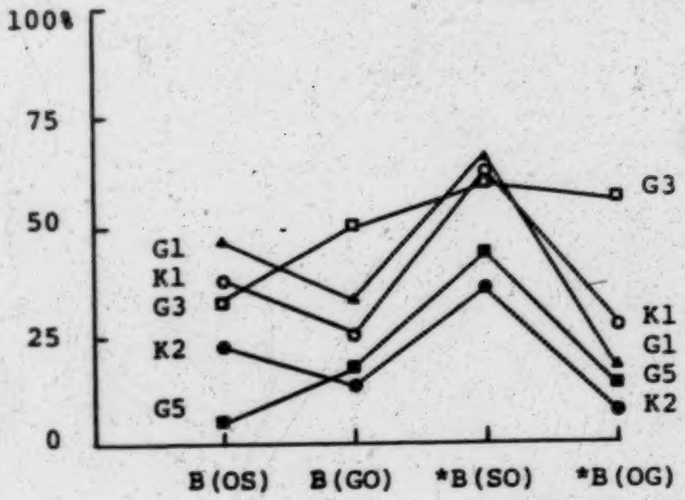
Experiment One (Neutral Context)

Frequency of Responses with the Reflexive Interpreted Exophorically

	B	B	*B	*B	Mean
	(OS)	(GO)	(SO)	(OG)	
K1 (4;5)	14(39%)	9(25%)	22(61%)	10(28%)	14(38%)
K2 (5;8)	8(22%)	5(14%)	13(36%)	3 (8%)	7(20%)
G1 (7;0)	17(47%)	12(33%)	23(64%)	7(19%)	15(41%)
G3 (9;0)	11(31%)	18(50%)	22(61%)	21(58%)	18(51%)
G5 (11;1)	1 (3)	7(19%)	16(44%)	5(14%)	7(20%)
Mean	10(28%)	10(28%)	19(53%)	9(25%)	12(34%)

Note in Table 4.6 that the *B(SO) structures received the exophoric interpretation with the highest frequency (mean=53%), as compared to an overall mean of 34%. Most of the other responses (total 66%) involved an 'endophoric interpretation' for the reflexive in which children chose an antecedent inside the test sentence. As far as the B patterns of anaphora are concerned, on the other hand, the overall frequency of exophoric responses was relatively low (mean=28%), indicating that children usually chose an antecedent inside the test sentence for this type of construction.

Figure 4.1 describes the interaction between age and types of anaphora, allowing us to observe the developmental trend more closely.



Percentage of Exophoric Responses
Age and Anaphora Types: Experiment One

Figure 4.1

As Figure 4.1 shows, the exophoric response was most frequent for *B(SO) in all age groups. It is also to be noted that in interpreting *B(SO) structures, G5 gave the exophoric interpretation less often than did three of the four younger groups (K1, G1, and G3), thus producing a higher number of incorrect responses. This was, of course, unexpected since older children are in general linguistically more sophisticated. I discuss this point further in section 4.5 below.

4.4.2. Experiment Two ('Topic Context')

In this experiment children's exophoric responses almost always involved selecting the discourse topic as antecedent for the reflexive; other entities (i.e., the two other dolls present in each setting) were rarely taken to be referents for the reflexive. I have therefore organized the data according to how often children selected the discourse topic in their exophoric responses. Let us first look at the frequency of exophoric interpretations from each age group. The relevant information is presented in Table 4.7 below.

Table 4.7

Experiment Two (Topic Context)

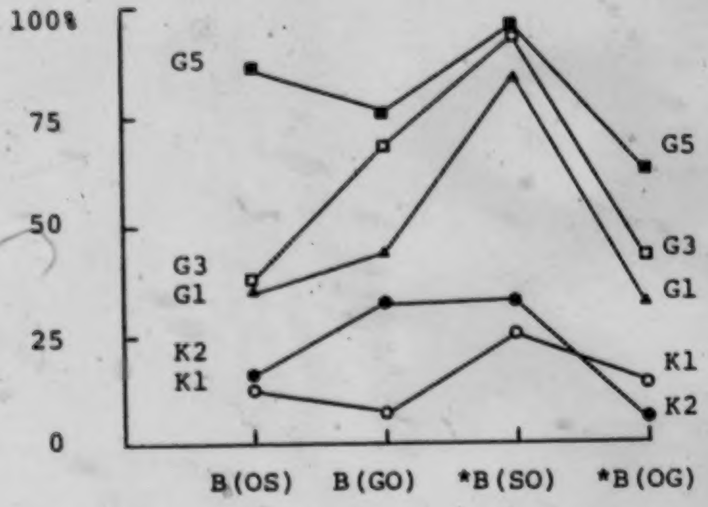
Frequency of Responses with the Reflexive Interpreted as Discourse Topic

		B	B	*B	*B	Mean
		(OS)	(GO)	(SO)	(OG)	
K1	(4;8)	4(11%)	3 (8%)	9(25%)	5(14%)	5(15%)
K2	(5;7)	5(14%)	11(31%)	11(31%)	2 (6%)	7(21%)
G1	(6;8)	13(36%)	16(44%)	30(83%)	11(31%)	18(49%)
G3	(9;2)	13(36%)	25(69%)	33(92%)	15(42%)	22(60%)
G5	(10;9)	31(86%)	27(75%)	35(97%)	22(61%)	29(80%)
	Mean	13(37%)	16(45%)	24(67%)	11(31%)	16(45%)

As we can see in Table 4.7, it was again *B(SO) that was interpreted most frequently with the help of a sentence-external antecedent. Compared to the results of Experiment One, the tendency here is much stronger in that all the older groups (G1-G5) preferred the exophoric interpretation (83%-97%) in sharp contrast with K1 and K2 (25%-31%). As in Experiment One, the two *B constructions were also treated differently, with at least the older children giving the exophoric interpretation for *B(SO) more frequently than for *B(OG). The significance of the differences between the actual number of exophoric responses for *B(SO) and *B(OG) was tested by a chi square analysis which indicated that the difference was significant ($X^2=4.82$, d.f.=1, $p<.05$).

As far as the B structures are concerned, only G5 strongly preferred the exophoric interpretation (75%-86%) for both B(OS) and B(GO), while G3 interpreted the discourse topic as antecedent more frequently for B(GO) than B(OS) (69% vs. 36%). The exophoric response rate obtained from K1 and K2, on the other hand, was fairly low (6%-31%) on all types of anaphora, and it seems to point to the possibility that these children tended to indiscriminately select the NP inside the test sentence as antecedent, regardless of the syntactic structure.

Figure 4.2 shows the interaction between age and anaphora types.



Frequency of Exophoric Responses
Age and Anaphora Types: Experiment Two

Figure 4.2

In contrast with what was observed in Experiment One, it is evident from the means for each age group in Table 4.7 that the frequency of exophoric responses increases with age, indicating that a developmental trend exists. In general, the older a child was, the more frequently the discourse topic was used to interpret the reflexive. This tendency was strongest for the *B(SO) constructions.

4.5. Discussion

An attempt is made here to interpret the major findings of the two experiments.

4.5.1. G5 and Experiment One ('Neutral Context')

A central issue relates to the way in which G5 behaved in Experiment One. As we saw in Section 4.4.1, the overall frequency of exophoric interpretation in G5 was only 20%. Moreover, unlike the younger children, the G5 group often considered the Experimenter to be the referent of the reflexive. This response type, which I call an 'E-Type', was observed in Experiment One only. Table 4.8 below gives the frequencies of the three different types of responses obtained from G5 in Experiment One.

Table 4.8

Experiment One (Neutral Context)

Percentage of Three Responses Types in G5

	B (OS)	B (GO)	*B (SO)	*B (OG)	Mean
Exophoric	3	19	44	14	20
Endophoric	97	47	56	67	67
E-Type	0	34	0	19	13
Total	100	100	100	100	100

As is evident in Table 4.8, the E-Type response was given to B(GO) and *B(OG) structures only. Interestingly, these are the only sentences in which *I* occurs as a grammatical subject, as the B(GO) example in (1) illustrates (see also Appendix II).

(1) *B(GO)*

(I hit, in *self*'s room, *Tom*.)

Nay-ka	*caki*-uy	pang-eyse	*Tom*-ul	ttayri-ess-tta.
I-N	*self*-G	room-L	Tom-A	hit-Pt-Dc

Two tentative explanations can be offered for why the E-Type responses occurred. The first relates to the possibility that children took the subject NP to be antecedent regardless of its person. Thus the subject *I* (referring to the experimenter) was taken to be antecedent for *caki*, despite the fact that it is not a third person NP.

Alternately, perhaps such grammatically first person subjects were reinterpreted semantically as third person subjects. Thus upon hearing the Experimenter say (1), children may have reformulated it into something like (1')

(1) *B(GO)*

(I hit, in *self*'s room, *Tom*.)

Nay-ka	*caki*-uy	pang-eyse	*Tom*-ul
I-N	*self*-G	room-L	Tom-A

ttayri-ess-tta.
hit-Pt-Dc

(1') Sensayng-nim-kkeyse caki-uy...(same as
Experimenter-H-N(H)

above)....

Note: The literal meaning of *sensayng-nim* is, in fact, 'teacher'. All of my subjects called me 'sensayng-nim', instead of 'Experimenter'.

One might wonder why I should be reinterpreted as the third person noun sensayng-nim rather than as the second person pronoun you. In Korean, however, there is simply no appropriate second person pronoun that can be used between older and younger people, especially if their relationship is rather formal (e.g., involving children and adults such as teachers, etc.). Thus when a second person is referred to in this type of situation, a noun indicating a name or profession is used. At any rate, the crucial point for our study is the assumption that children giving the E-Type responses may have rephrased (1) into (1') in which the (understood) grammatical subject is a third person NP referring to the 'Experimenter' and is therefore eligible to be the antecedent of the reflexive pronoun.

Notice, however, that no matter how plausible these two explanations may be, the endophoric interpretation is still dominant as can be seen in Table 4.8. For the *B structure, in particular, many G5 children still incorrectly chose the endophoric antecedent (56%-67%). In Experiment Two (with 'topic context'), in contrast, the children in G5 selected the discourse topic as antecedent 86%-97% of the time in *B(SO) and B(OS) (see Table 4.7 above). This sharp contrast is presumably due to differences in the context types used in the two experiments. Although the neutral context may have successfully created a story-like setting, it is apparently not rich enough to ensure that children singled out a specific third person NP as antecedent.

(Recall that no third person singular NPs were mentioned in the neutral context.) This in turn suggests that backward constructions are difficult to interpret in the absence of an appropriate context.

Support for this assumption comes from Watson (1985:38-50), who also found that a 'neutral' context containing no specific potential antecedent often impairs interpretation of blocked anaphora. She worked with twenty-one adults using blocked pronominal anaphora in English sentences like (2).

(2) *For her Andrea bought the picture of
    the Toronto sky.

Watson discovered that the subjects blocked coreference in a structure like (2) 65% of the time when a neutral context preceded it. However, when the context contained a specific NP which could serve as antecedent, they blocked coreference 89% of the time. On the basis of the finding, Watson claimed that:

> ...experimental noise is increased when subjects find in a sentence a pronoun that requires an antecedent outside the sentence yet within the near discourse context no clear choice of antecedent may be found....(p.46)

The role of a proper context in the interpretation of the blocked anaphora has also been noted by Suzuki (1985) in her study of Japanese. Working with sixty Japanese-speaking children (ages 4;0-11;0) on blocked backward anaphora (i.e., *B(SO)) in isolated sentences, she discovered that most of the subjects under the age of 9;0

misinterpreted the structure by taking the NP inside the test sentence to be the antecedent, thus ignoring dolls present in the experimental setting. Table 4.9 contains the percentage of exophoric (thus correct) interpretations provided by her subjects.

Table 4.9

Percentage of Exophoric Responses of *B(SO) in Japanese Children (Suzuki 1985)

K1 (4;0)	0
K2 (5;0)	6
G1 (7;0)	0
G3 (9;0)	47
G5 (11;0)	47
Mean	20

Notice that although the older children (9;0-11;0) performed much better than the others, the percentage of exophoric responses was still less than 50%, indicating that many of these subjects incorrectly interpreted the blocked backward constructions.

4.5.2. Processing Strategies and Experiment Two

It is well known that language development is often influenced by processing factors such as the phonetic salience of a morpheme (Slobin 1982:151) and the order in which NPs occur in a sentence (Bever 1970). In this section we examine the relationship between the overall results of Experiment Two and children's processing strategies, including what I will call the 'Discourse Topic Strategy', the 'Minimal Distance Strategy', and the 'Recency Strategy'. We will examine children's performance on both backward and forward constructions.'

4.5.2.1. Discourse Topic Strategy

When anaphors are used in a discourse context, they very often refer to an NP that has been previously mentioned in discourse. Thus she in (1b) is likely to be Mary when it is used in a context like (1a).

(1) a. Mary had been sick for a few days.

b. This morning Jane said that she was feeling better.

It is certainly not impossible that children use a discourse strategy such as (2) for all types of structures.

(2) Discourse Topic Strategy (DTS)

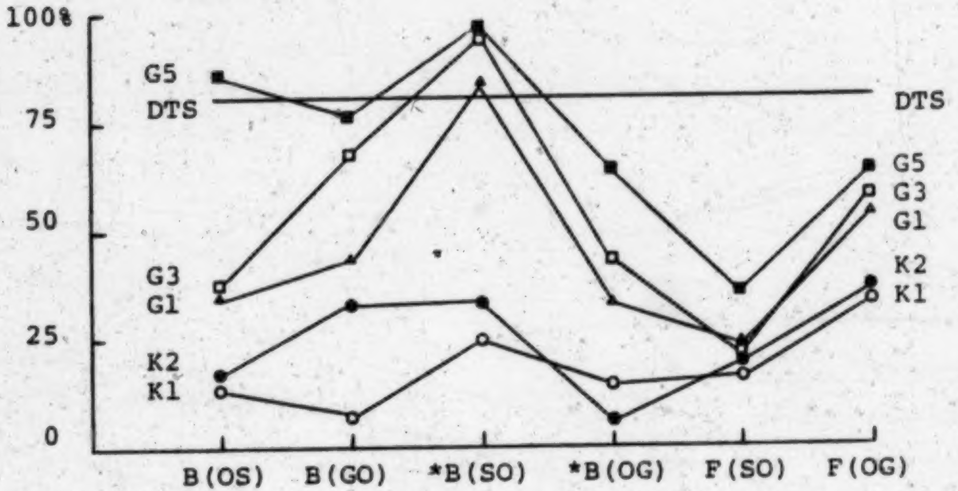
Select the discourse topic as antecedent.

Note that if Korean children consistently use the DTS, they will achieve a high level of exophoric interpretation for all types of backward and forward anaphora. This prediction is expressed in (2').

(2') Prediction of the DTS:

All six types of anaphora will be interpreted exophorically.

The data in Figure 4.3 allows us to determine whether this prediction matches the actual findings of Experiment Two. (For expository purposes, I arbitrarily assume 80% as a reasonable 'high' predicted value and 20% as a complementary 'low' predictor.)



Prediction of the DTS

Figure 4.3

As Figure 4.3 shows, the high proportion of exophoric responses predicted by the DTS is fairly close to the scores achieved by older groups (G1-G5) on the *B(SO) structures. The behaviour of the children in G5 on the two B structures seems to support the prediction as well. Obviously, however, the DTS does not explain why the older children preferred the endophoric interpretation for the F(SO) pattern, in sharp contrast with F(OG) and *B(SO) constructions. A chi square analysis indicated that the difference between F(SO) and F(OG) was significant (X^2=5.14, d.f.=1, $p<.05$). The means between F(SO) and *B(SO) were also found to be significantly different ($X^2=8.0$, d.f.=1, $p<.01$). Moreover, it is to be noted that the performance of the two youngest groups (K1 and K2) seems to be completely inconsistent with the prediction made by the DTS.

4.5.2.2. Minimal Distance Strategy

Another strategy which might influence children's interpretation of reflexives relates to C. Chomsky's (1969:11) finding that 5- and 6-year old English-speaking subjects tend to think that the antecedent for the PRO subject of an infinitive verb is the nearest NP to the left. For example, younger children would often misinterpret (1) by taking Mary to be subject of go.

(1) Tom promised Mary [PRO to go].

Notice that in (1) Mary is closer to go than Tom is. The strategy causing the error is referred to in the literature as the 'Minimal Distance Principle', following Rosenbaum (1967).

Of interest to us is the extent to which children's interpretation of the reflexive is affected by the distance between the anaphor and eligible antecedents. In (2) I define a 'Minimal Distance Strategy' (MDS) which might be sensitive to this variable.

(2) Minimal Distance Strategy (MDS)

Take the closest NP preceding caki as antecedent.

The contrasts relevant to (2) are represented in (3).

(3) a. Backward

NP$_1$ (Topic)... / Caki.........NP$_2$

Context Test Sentence

b. Forward

NP$_1$ (Topic)... / NP$_2$.........Caki

Context Test Sentence

Notice that only one NP (NP$_1$) occurs to the left of caki in the backward structure (3a), while two NPs (NP$_1$ and NP$_2$) precede caki in the forward case (3b). The nearest NP in (3b) (i.e., NP$_2$) is the intrasentential subject phrase.

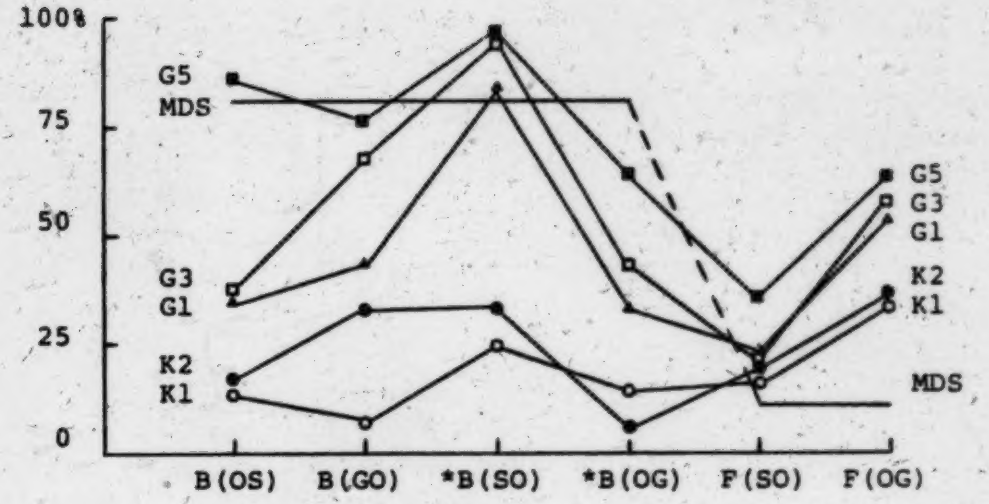
It is therefore predicted that children who behave in conformity with the MDS will treat patterns of backward anaphora differently from the forward cases. Since the closer NP in the backward pattern is the discourse topic, children employing the MDS will tend to interpret the backward cases exophorically. In contrast, the antecedent in the forward cases will be found endophorically, since the closer NP occurs inside the test sentence. This prediction is outlined in (2') below.

(2') Prediction of the MDS

A backward pattern of anaphora is interpreted exophorically;

A forward pattern is interpreted endophorically.

This prediction and the actual findings of Experiment Two are compared in Figure 4.4.



Prediction of the MDS

Figure 4.4

As we can see in Figure 4.4, our prediction seems to be supported by the high percentage of exophoric responses given by the G5 children on the B and *B(SO) structures. In addition, the low frequency of exophoric responses for F(SO) found in most of the subjects seems to confirm the hypothesis under consideration. Unfortunately, however, the MDS encounters the same problem as the DTS, since it fails to explain why the two *B structures were treated in a significantly different way by most of the children. (As we saw in 4.4.2, a chi square analysis indicated that the difference was significant at $p<.05$.) Moreover, the MDS also has no explanation for why the two F structures were treated differently.

4.5.2.3. Recency Strategy

Still another explanation for the observed facts might be based on the assumption that children seem to be able to remember better what has been mentioned last (most recently). For instance, the most recent NPs in (3) above (section 4.5.2.2) are NP_2 for both backward and forward cases, respectively. The relevant strategy here might be called the 'Recency Strategy' (RS) and defined as follows.

(1) Recency Strategy (RS)

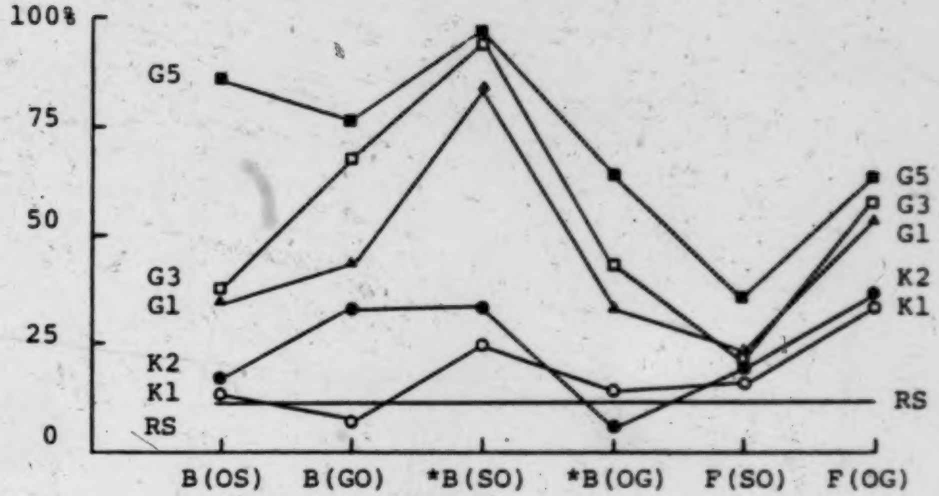
Take the last-mentioned lexical NP as antecedent.

Since the most recent lexical NPs occur within the test sentence for all types of anaphora, the RS predicts that children will give a high frequency of endophoric interpretation to all types. The prediction is expressed as follows.

(1') Prediction of the RS

All types of anaphora will be interpreted endophorically.

Figure 4.5 compares the prediction of (1') with the actual results of Experiment Two.



Prediction of the RS

Figure 4.5

The prediction of the RS receives support from the response pattern of the two youngest groups (K1 and K2) in which the actual findings closely match the predictions made by the RS. However, Figure 4.5 clearly shows a large gap between the prediction based on the RS and the performance observed in G1-G5 on the B and *B structure, suggesting that this strategy is also fundamentally inadequate.

4.5.3. Grammatical Principles and Experiment Two

The preceding section (4.5.2) has been concerned with the possible influence of processing strategies on the results of Experiment Two. It was noted that although the processing strategies under consideration seem to shed light on certain aspects of children's behaviour, a central question still remains unanswered. In particular, an explanation has not yet been given with regard to why the two blocked structures, *B(SO) and *B(OG), were interpreted in a significantly different manner by the G1-G5 children.

In this section I make an attempt to develop *linguistic* explanations for the children's behaviour in Experiment Two with a focus on backward structures. To do this, I will once again examine the results which have been presented in Table 4.7. This time, however, I will look at the findings from a slightly different point of view. Thus Table 4.7' below has exactly the same content as Table 4.7, the only difference being that the results are now organized with respect to the grammatical relations associated with the lexical NP and caki in each construction.

Table 4.7'

Experiment Two (Topic Context)

Percentage of Responses with the Reflexive Interpreted Exophorically

	Condition I (S/O)		Condition II (O/G)	
	B (OS)	*B (SO)	B (GO)	*B (OG)
K1 (4;7)	11	25	8	14
K2 (5;8)	14	31	31	6
G1 (7;1)	36	83	44	31
G3 (9;2)	36	92	69	42
G5 (10;9)	86	97	75	61
Mean	37	67	45	31

Conditions I and II in Table 4.7' differ from each other on grammatical grounds in that in the former the terms in the anaphoric relationship are subject and direct object. In the latter condition, in contrast, the interaction is between object and genitive. As we saw earlier, and as the data in Table 4.7' clearly indicates, the two blocked cases *B(SO) and *B(OG) were interpreted differently. It is also clear that B(OS) and *B(SO) were treated differently by children, particularly those in G1-G3. More specifically, *B(SO) received the highest frequency of exophoric responses. These findings require an explanation.

First of all, note the difference between the means for first two columns, B(OS) and *B(SO) (37% vs. 67%). Notice also that in the blocked *B(SO), the reflexive functioning as S is *higher* than the NP that follows it, namely O. I take this to suggest that the child knows that coreference is blocked if the reflexive is higher than the NP that follows it. I would therefore like to propose that children know that subjects are higher than direct objects in the hierarchy (as in (1b)) and that they have a principle resembling (1a).

(1) a. Child's Anaphora Principle

Coreference is allowed when the antecedent is higher than the reflexive.

b. Child's Initial Relational Hierarchy

S > ..O ..G...

The child's principle (1a) blocks coreference in *B(SO), since the reflexive (S) precedes a lower antecedent (O) in violation of (1a). On the other hand, the principle allows coreference in B(OS), since the reflexive (O) in this structure precedes a higher antecedent (S). This is reflected in Table 4.7' (Condition I) since children in G1-G3 allowed coreference between the reflexive and a third person NP for B(OS) significantly more often than for *B(SO).

Notice that the constraints in (1) are not overtly manifested in the way G5 interpreted B(OS) and *B(SO). As Table 4.7' indicates, children in G5 used the topic context 86%-97% of the time for both B(OS) and *B(SO). Importantly, however, recall that free backward type B(OS) can be correctly interpreted either exophorically or endophorically. It seems then reasonable to think that the older children G5 could store and retrieve information better than younger children and were thus able to use it more frequently for both structures when it was needed (Olson 1973:147).

Consider now Condition II. *B(OG) is a blocked case, and thus should be interpreted exophorically only. As is evident in the table, however, most children misinterpreted it by ignoring the discourse topic (this is especially evident in K1-G3). On the basis of this, I suggest that these children have not yet learned the relationship between G and O in the hierarchy. The child's hierarchy would therefore resemble (1b) in which the subject is higher than the object, while the object and the genitive are not ordered with respect to each other. Because the hierarchy is incomplete, children initially lack the means to block coreference in Condition II. There is, however, gradual improvement since G5 children give exophoric responses 61% of the time. On the basis of this development, I propose that the next version of the hierarchy to develop in children is (2).

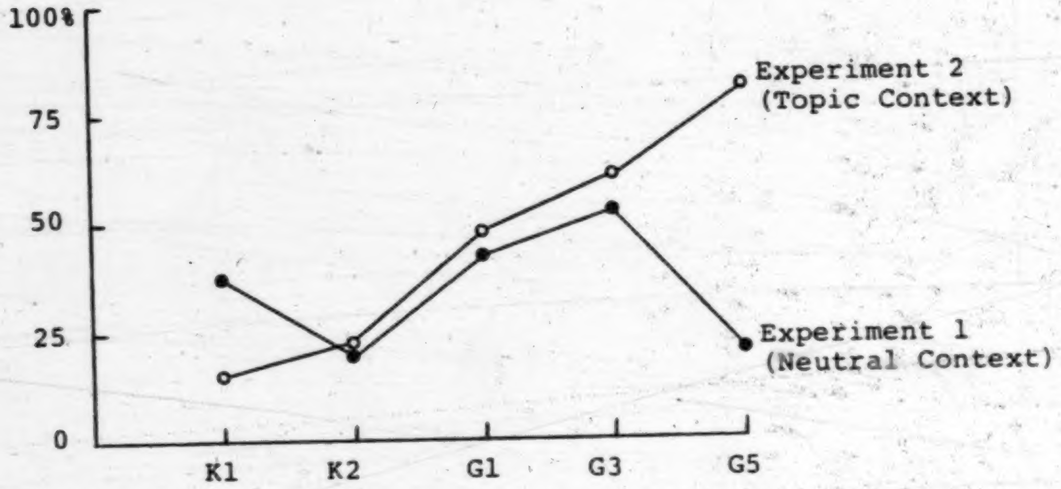
(2) Child's Relational Hierarchy

S > O > G

As in the forward study, then, we have reason to believe that the relational hierarchy emerges gradually, with the rank of subject being determined (around G1) well before the relative status of objects and genitives is established. I attempt to provide an explanation for this developmental sequence in chapter five.

4.5.4. Development and Experiment Two

Figure 4.6 below shows how often each age group selected the discourse topic as antecedent of the reflexive in Experiments One and Two.



Developmental Trend (Experiments One and Two)

Frequency of Exophoric Interpretation at Each Age Level Across Types

Figure 4.6

Figure 4.6 indicates that a gradual increase in the frequency of the exophoric interpretation occurred with age in Experiment Two, but not in Experiment One. In particular, it is to be noted that in Experiment Two the discourse topic significantly affected the interpretation of the reflexive only in children older than G1 (mean 7;1). Very importantly, children's sensitivity to the discourse topic was highly *selective*. The degree to which the context was used seemed to be governed by the type of backward anaphora. As we saw earlier in Section 4.4.2, the older children used the discourse topic more often for *B(SO) and B(GO) than for *B(OG) or B(OS). The two younger groups (K1-K2), on the other hand, used the context infrequently (6-31% of the time) for all types of backward anaphora, a finding that was consistent with the Recency Strategy for these groups.

4.6. Experiment Two and Other Studies

The developmental trend just noted differs from the finding reported by Tyler (1983:335), who observed that 'younger children are more dependent on the thematic structure of a discourse than are older children.' She notes:

> ...whereas 5-6 year olds adhere strongly to the principle that utterance-initial slots must be reserved for reference to the thematic subject [discourse topic], this constraint is relaxed as children get older.

The difference between Tyler's findings and Experiment Two may be attributed to the fact that the topic context in Experiment Two contained a 'distractor' sentence in addition to a topic sentence, while the context used by Tyler involved a topic sentence only with no distractor, as in (1) (from Tyler (ibid.:329)).

(1) Topic Sentence

The skater in the orange suit was our nephew.

Test Sentence

He fell on the ice and broke his leg.

It is not impossible that the distractor in Experiment Two made it more difficult for younger children to store and retrieve the discourse topic in my experiment. It is important, however, to realize that whereas the older children in Tyler's study did not rely heavily on the discourse topic, the G1-G5 groups in Experiment Two were actually more sensitive to context than younger children, particularly for *B(SO) and B(OS) types, as noted earlier.

On the other hand, some other studies report that children tend to search for an antecedent only within the sentence containing the pronoun, largely ignoring contextual information. For example, in one of his experiments on forward anaphora, Solan (1978:157) provided his subjects with a context before they heard the target sentence (an utterance containing an anaphor and a potential antecedent). An example is given in (2).

(2) Context:

This is a story about the cow. The cow
doesn't get enough exercise. The cow
has to make sure that the other animals
behave.

Target Sentence:

Last week, the horse told the sheep that
he would run around.

There were thirty-three subjects, eleven from each of three age groups - five, six, and seven years. It was found that the children used the context only 18% of the time in determining the antecedent (*ibid.*:159). The rest of the time, they simply selected an antecedent from the sentence containing the anaphor.

Wigodsky (1977) also carried out an experiment relevant to the issue we are considering. The experiment, which made use of twenty-five nine-year-old Hebrew-speaking children, worked as follows. A short paragraph consisting of four sentences was first read aloud and then presented in writing. The last three sentences included pronouns whose antecedents could only be found in the first sentence of the paragraph. The paragraph was followed by a series of questions which served to determine how the pronouns were interpreted. In this study only blocked backward patterns of anaphora were used. An example is given in (3).

(3) Context:

Uri was walking in the street. He
found a book Ehud had lost. Then he
returned home after Ehud had managed to
repair the short circuit.

Target Sentence (Blocked Backward):

He turned on the television before Ehud had begun to do the homework the teacher had given him.

Question:

Who turned on the television?

Wigodsky (ibid.:29-30) assumed that the context would facilitate the comprehension of the blocked backward construction. However, the result indicated that many children still tried to find the antecedent within the target sentence, blocking coreference only 47% of the time.

The studies just discussed point to the conclusion that discourse information does not significantly affect children's interpretation of anaphora. However, I do not think that these experiments can effectively assess the child's sensitivity to discourse. Solan's study, for example, involves a target sentence in which an anaphor is preceded by two NPs (e.g. the horse and the sheep in (2) above). However, neither of these NPs even occurs in the discourse, which introduces a third NP (cow). It is conceivable that even if Solan's subjects were sensitive to discourse information, they simply relied on the two NPs which immediately precede the anaphor in a target sentence for reasons relating to limitations on working memory. Thus the finding that children selected an extrasentential NP as antecedent only 18% of the time may not necessarily indicate a lack of sensitivity to discourse context.

Wigodsky's experiment, on the other hand, involves a slightly different problem pertaining to the context it employed. As exemplified in (3), the NP (Ehud) is not only used in the target sentence but is also repeated in the context. Moreover, the second instance of Ehud in the pragmatic lead is almost immediately followed by the anaphor in the target sentence. Since the same NP was used in both the target sentence and the discourse, it is not clear how Wigodsky determined which NP her subjects were thinking of when they chose Ehud as antecedent.

Unfortunately, a direct comparison of the results of these two studies with my own experiments is difficult. The discourse contexts used in each study are qualitatively different with respect to either the point of presentation of the various third person NPs or the number of times each third person NP was used in the context and target sentence. It is hoped that future studies can make use of a variety of anaphoric structures and contexts in which the relevant variables are equally controlled. This will enhance our understanding of how discourse affects children's interpretation of anaphors.

4.7. Summary and Conclusion

In the present chapter I have examined the effect of context on Korean children's interpretation of the reflexive pronoun caki in backward patterns of anaphora. In particular, I have inquired into (a) the effect of 'neutral' vs. 'topic' contexts, (b) the interaction of the effect of context with the children's strategies and grammatical rules, and (c) any evident developmental trends.

It was found that in general the topic context had a greater effect on children's interpretation than did the neutral context. It was also noted that children's sensitivity to the topic context increased with age. Unlike the subjects studied by Tyler (1983:335), it was the older children (G1-G5) - not the five-six year olds - who used context more frequently. Importantly, their sensitivity to context was highly selective in that it was strongest for *B(SO) and, particularly in G5, B(OS). Hence, the effect was not the same across all four types of backward anaphora and all groups of children.

Possible processing factors such as the Discourse Topic Strategy (DTS), the Minimal Distance Strategy (MDS), and the Recency Strategy (RS) were also assessed against the children's performance observed in Experiment Two. It was noted that the RS was best supported by the behaviour of the children in K1 and K2, but that all the strategies failed to explain the fact that the two F structures and the two *B cases were each treated in a significantly different manner by older groups.

An attempt was made to develop a linguistic explanation for why children preferred the exophoric interpretation for *B(SO) in sharp contrast with *B(OG). It was suggested that the children had probably formulated a hierarchy in which S is higher than O and a principle that coreference is blocked if the reflexive is higher than its antecedent. In light of the fact that G5 gave many exophoric (thus correct) responses to *B(OG), it was also proposed that the next stage in the development of hierarchy is the addition of the component 'O>G'. An obvious question which arises at this point has to do with *why* the child's linguistic knowledge of anaphora develops in this way. This 'acquisition' problem is explored in chapter five that follows.

Note to Chapter 4

1. Because the set of data in my study was not sufficiently large, a goodness-of-fit test was not attempted, but rather a series of informal comparisons was made between the data and the predictions of each of the hypothetical strategies.

CHAPTER 5

EXPLAINING THE ACQUISITION OF REFLEXIVE ANAPHORA

5.0. Preface

We have seen in chapters three and four how children interpret the reflexive caki in forward and backward constructions. The present chapter focusses on our major findings about the development of anaphora in an attempt to determine how the Relational Hierarchy and the related principles are learned.

5.1. The Acquisition Problem

It was observed earlier that children's interpretation of the reflexive pointed to a relational hierarchy which develops in the following manner.

(1) The Development of the Relational Hierarchy

I. K1: No hierarchy
II. K2-G3: S >..O..G...
III. G5: S > O > G

It was also proposed that children develop the anaphora principle in (2) in connection with (1). (Recall that the Distinct Rank Constraint is a special case of the more general Precedence Constraint discussed in chapter two.)

(2) a. Priority Condition (Forward):

Choose the highest eligible NP as antecedent.

b. Distinct Rank Constraint (Backward):

> Coreference is allowed when the antecedent is higher than the reflexive.

The evidence for (1) and (2) came from the fact that while younger children in K1 behaved randomly in interpreting forward constructions (thereby suggesting that no hierarchy had developed yet), many children in K2-G5 succeeded in the SO (*Tom* pushed in *self*'s home) and GS types (*Tom's* *brother* saw *self* in a photo). However, these same children often misinterpreted the GO type (e.g., I pushed *the child's friend* in *self*'s home), suggesting that they did not know the relative rank of these two categories in the hierarchy. Although the occurrence of this error pattern decreased with age, the older children in G3-G5 still had found the GO type the most difficult.

These findings raise the following important questions.

(3) a. The Acquisition Order Problem:

Why do 'S>O' and 'S>G' develop before 'O>G'?

b. The Stage Transition Problem:

What type of data triggers changes in the structure of the child's relational hierarchy, ultimately allowing attainment of the adult system?

The first problem relates to the cause of acquisition order whereas the second is concerned with the motivation for the transition between stages. I propose in this chapter that these questions can be answered with the help of the following two assumptions.

(4) a. Korean children exploit grammatical relations in mastering the

interpretation of the reflexive pronoun.

b. The 'positive data' relevant to the development of the reflexive is available in experience.

A detailed discussion for each argument is provided in 5.2 below.

5.2. The Role of Grammatical Relations and 'Positive Data'

5.2.1. Grammatical Relations

It is difficult to imagine how Korean children could formulate the principles for interpreting the reflexive on the basis of semantic information alone. As noted in chapter two, the semantic role of a third person NP does not systematically determine whether it can be the antecedent. As (1) and (2) below show, there is no one-to-one relationship between an NP's semantic role and its eligibility to be the antecedent of the reflexive.

(1) a. (Tom played in self's room.)

Tom-i caki-uy pang-eyse nol-ass-tta.
Tom-N self-G room-L play-Pt-Dc

b. (Tom was pushed by Mary in self's home.)

Tom-i Mary-hanthey caki-uy cip-eyse
Tom-N Mary-by self-G home-L

mil-li-ess-tta.
push-PASS-Pt-Dc

c. (Tom received self's book.)

Tom-i caki-uy chayk-ul toliepat-ass-tta.
Tom-N self-G book-A receive-Pt-Dc

d. (In Tom's home I read self's book.)

Tom-uy cip-eyse Nay-ka caki-uy chayk-ul
Tom-G home-L I-N self-G book-A

ilge-ess-tta.
read-Pt-Dc

(1') Semantic Role of the antecedent *Tom* in (1)

a. agent
b. patient
c. recipient
d. genitive

As (1') indicates, the antecedent of the reflexive can have a variety of semantic roles. Significantly, however, the fact that an NP has one of these semantic roles does not guarantee that it can serve as antecedent for caki. This is illustrated in (2).

(2) a. (Mary was scolded by Tom in self's room.)

*Mary-ka Tom-hanthey caki-uy pang-eyse
Mary-N Tom-by self-G room-L

yatanmaca-ass-tta.
was scolded (literally, received scold)-Pt-Dc

b. (Mary pushed Tom in self's room.)

*Mary-ka Tom-ul caki-uy pang-eyse mil-ess-tta.
Mary-N Tom-A self-G room-L push-Pt-Dc

c. (Mary sent Tom self's book.)

*Mary-ka Tom-eykey caki-uy chayk-ul
Mary-N Tom-D self-G book-A

ponay-ayss-tta.
send-Pt-Dc

d. (Mary read, in Tom's room, self's book.)

*Mary-ka Tom-uy pang-eyse caki-uy chayk-ul
Mary-N Tom-G room-L self-G book-A

ilge-ess-tta.
read-Pt-Dc

(2') Semantic Roles of the Non-Antecedent *Tom* in (2)

a. agent
b. patient
c. recipient
d. genitive

As (2') shows, although the NP Tom in (2) bears exactly the same semantic roles as in (1), it cannot be the antecedent. This fact does not create a problem if grammatical relations (GRs) are exploited to characterize the conditions under which caki is linked to an antecedent. In the sentences in (2), for example, our analysis predicts that the NP Tom cannot be the antecedent because there is always a higher NP, the subject phrase Mary.

Even linguists whose approach to language is centered around semantics or discourse-based functionalism typically admit the relevance of GRs to the characterization of at least some linguistic phenomena. Schlesinger (1982:283), for example, observed that 'pseudocleft structures apply both to the Agent-Action relation [It is Mary Anne who is skating] and the Entity-Attribute [It is Mary Anne who is pretty],' and concluded:

> There is, then, room for an abstract '*subject*' category that comprises both the Agent and the Entity having an Attribute (emphasis is my own).

Functionalists like Bates & MacWhinney (1982:214-215) also propose that:

> ...elements that possess some subset of the features of agent-topic[,] [f]or example, instruments may be mapped as *subject* via overlap with a subset of agent-topic features (emphasis is my own).

Children's sensitivity to GRs has been independently observed in four- and five-year-olds in at least two studies. For example, Marantz (1983:167) taught three- to five-year-old children to use novel verbs associated with different networks of semantic roles. The crucial contrast for us is between an agent-action-patient predicate like moak in Larry is moaking the book (meaning 'Larry is pounding the book with his elbow') and patient-action-agent verb like pume in The book is puming Larry (meaning 'Larry is pounding the book with his elbow'). It was found that 'five-year-olds learned all the verbs with equal ease,' although three- and four-year-olds generally found it much easier to learn an agent-action-patient verb like moak than pume. From this Marantz concluded that the five-year-olds were not mapping semantic roles directly onto structural positions and that they had acquired a notion of subject which was independent of semantic roles.

In another study Lebeaux & Pinker (cited in Pinker (1984:59) found that even four-year-old children 'had no trouble acquiring novel verbs modeled in the passive voice.' It was thus claimed that children 'could learn the grammatical relations encoding the verb arguments only from their distribution within the sentence,' independent of their semantic roles.

Consistent with these more general trends, we have seen in chapter three that many of G1-G5 children could correctly interpret the reflexive in actives and passives. Since this involved selection of the subject NP as antecedent regardless of its semantic role, it seems reasonable to formulate the following assumption.

(3) Korean children exploit grammatical relations in mastering the interpretation of the reflexive pronoun.

5.2.2. Positive Data

By 'positive data' (PD) I mean the utterances which children are exposed to in a natural language learning environment. I assume here that children make use of PD available to them in order to generalize or hypothesize about permissible linguistic structures; they do not use negative data in order to hypothesize about non-permissible cases. Importantly, however, this is not to suggest that children must get access to every specific instance of a linguistic phenomenon in order to master the grammar. Rather, it is proposed that children formulate linguistic rules on the basis of more general accounts employing grammatical relations. Thus, I argue that the following two kinds of positive evidence are available for children to use in learning the grammar of the reflexive pronoun.

(1) Positive Data (PD):

I. Data bearing on the consistency of the role played by the subject in the interpretation of the reflexive

II. Data bearing on the Relational Hierarchy'

5.2.2.1. PD I: Consistency of the Role Played by the Subject

To begin, let us briefly review a sampling of simple syntactic patterns in which S(ubject), O(bject), and G(enitive) NPs serve as antecedent for the reflexive. First, consider the sentences in (1), each of which contains a third person NP in S position (S-NP).

(1) S-NP

a. (Tom hates self.)

Tom-i	caki-rul	shireha-an-ta.
Tom-N	self-A	hate-Pr-Dc

b. (Tom whispered to self.)

Tom-i	caki-eykey	cwungelkeri-ess-tta.
Tom-N	self-D	whispered-Pt-Dc

c. (Tom played in self's home.)

Tom-i	caki-uy	cip-eyse	nol-ass-tta.
Tom-N	self-G	home-L	play-Pt-Dc

Notice that the S-NP Tom can (in fact, must) be the antecedent in all cases in (1). This contrasts with what happens when a third person NP is O or G. Consider the following.

(2) O-NP

a. (Tom pushed John in self's room.)

Tom-i	John-ul	caki-uy	pang-eyse	mil-ess-tta.
Tom-N	John-A	self-G	room-L	push-Pt-Dc

b. (I saw, in self's home, Tom.)

Nay-ka	caki-uy	cip-eyse	Tom-ul	po-ass-tta.
I-N	self-G	home-L	Tom-A	see-Pt-Dc

c. (I saw Tom in self's home.)

Nay-ka	Tom-ul	caki-uy	cip-eyse	po-ass-tta.
I-N	Tom-A	self-G	home-L	see-Pt-Dc

(3) G-NP

a. (I saw, in Tom's home, self's dog.)

Nay-ka Tom-uy cip-eyse caki-uy kay-rul
I-N Tom-G home-L self-G dog-A

po-ass-tta.
see-Pt-Dc

b. (Tom's friend saw self in a photo.)

Tom-uy chinkwu-ka caki-rul sachin-eyse
Tom-G friend-N self-A photo-in

po-ass-tta.
see-Pt-Dc

c. (I pushed John's friend in self's room.)

Nay-ka John-uy chinkwu-rul caki-uy pang-eyse
I-N John-G friend-A self-G room-L

mil-ess-tta.
push-Pt-Dc

d. (I saw, in self's home, Tom's book.)

Nay-ka caki-uy cip-eyse Tom-uy chayk-ul
I-N self-G home-L Tom-G book-A

po-ass-tta.
see-Pt-Dc

Note that when a third person NP is O or G, it cannot always serve as antecedent for the reflexive (see, for example, (2a), (3b), and (3c)). We can summarize this observation as follows.

(4) Subject NPs behave more consistently than O or G with respect to the interpretation of the reflexive.

The second set of data relevant to this generalization involves OSV constructions. A representative sampling of these structures is presented below.

(5) S-NP

a. (Self, Tom hates.)

Caki-rul Tom-i shireha-an-ta.
self-A Tom-N hate-Pr-Dc

b. (To self, Tom whispered.)

Caki-eykey Tom-i soksakie-ess-tta.
self-D Tom-N whisper-Pt-Dc

c. (Self's book, Tom read.)

Caki-uy chayk-ul Tom-i ilke-ess-tta.
self-G book-A Tom-N read-Pt-Dc

(6) O-NP

a. (Tom pushed John in self's room.)

Tom-i John-ul caki-uy pang-eyse mil-ess-tta.
Tom-N John-A self-G room-L push-Pt-Dc

b. (Tom, I saw in self's home.)

Tom-ul nay-ka caki-uy cip-eyse po-ass-tta.
Tom-A I-N self-G home-L see-Pt-Dc

(7) G-NP

a. (Tom's friend saw self in a photo.)

Tom-uy chinkwu-ka caki-rul sachin-eyse
Tom-G friend-N self-A photo-in

po-ass-tta.
see-Pt-Dc

b. (Tom's book, I read in self's home.)

Tom-uy chayk-ul nay-ka caki-uy cip-eyse
Tom-G book-A I-N self-G home-L

ilke-ess-tta.
read-Pt-Dc

Interestingly, we again find the same pattern here as in the SOV structures. As before, a third person subject NP can always be the antecedent of caki (see (5)), while an object or genitive NP cannot (see (6a) and (7a)). This is consistent with the claim made in (4). Thus, it seems reasonable to assume that PD I provides evidence of the following phenomenon relevant to anaphora.

(4) PD I:

Subject NPs behave more consistently
than O or G.

5.2.2.2. PD II: Data on the Relational Hierarchy

Positive data relevant to the organization of the relational hierarchy is available from similar types of monoclausal structures. Examples which involve the 'S>O>G' component of the hierarchy are provided in (1) below.

(1) a. S>O

(Tom pushed John in self's room.)

Tom-i John-ul caki-uy pang-eyse mil-ess-tta.
Tom-N John-A self-G room-L push-Pt-Dc

b. O>G

(I pushed John's friend in self's room.)

Nay-ka John-uy chinkwu-rul caki-uy pang-eyse
I-N John-G friend-A self-G room-L

mil-ess-tta.
push-Pt-Dc

c. S>G

(Tom's friend saw self in a photo.)

Tom-uy chinkwu-ka caki-rul sachin-eyse
Tom-G friend-N self-A photo-in

po-ass-tta.
see-Pt-Dc

The simple sentences exemplified above provide the evidence needed to determine that subjects occupy the highest rank in the hierarchy and that objects are higher than genitives. We can state the relevance of this fact as follows.

(2) PD II:

Data is available to trigger development of the Relational Hierarchy.

5.3. Explanation

5.3.1. 'Acquisition Order' Problem

Earlier, we raised a question about why the S>O and S>G positions of the relational hierarchy develop earlier than O>G component in Korean children. I propose that this developmental sequence results from children's formulation of the following generalization in (1) in response to positive data of type I repeated here in (2).

(1) Choose a subject as antecedent over any other NPs.

(2) Positive Data I

Subject NPs behave more consistently than O or G.

The formulation in (1) above is equivalent to (1') as follows.

(1') a. Choose the highest NP as antecedent.

b. Relational Hierarchy: S > ..O..G..

Obviously, the child's initial hierarchy and principle in

(1') are not the same as the adult's. This brings us to the question of how children make the transition to the adult system.

5.3.2. 'Stage Transition' Problem

Our second problem concerns the motivation for the child's movement from the incomplete generalization (i.e., (1'b) in 5.3.1) to the correct one. In particular, my study on the GO forward structures (I pushed *the child's friend* in *self*'s room) indicated that a large number of children mistakenly chose G as the antecedent of the reflexive. It was thought that this in turn indicates that children had not yet established the hierarchy 'O>G', which seemed to gradually emerge in G5 only. The question, then, is how children ultimately attain the correct relational hierarchy.

The relevant experience consists of positive data of type II repeated in (1) below.

(1) Positive Data II:

> Data is available to trigger development
> of the Relational Hierarchy.

Let us assume, for instance, that a child who did not know the relative status of O and G heard the following sentence used in a context where the intended interpretation was clear.

(2) (I pushed John's friend in self's room.)

Nay-ka John-uy chinkwu-rul caki-uy pang-eyse
I-N John-G friend-A self-G room-L

mil-ess-tta.
push-Pt-Dc

As indicated in (1), the antecedent is the direct object John's friend - evidence which shows that direct object is higher than genitive.

5.4. Summary and Conclusion

This chapter has explored the problem of 'acquisition order' and 'stage transition' for the principles we have considered in this thesis. In an attempt to resolve these problems, it was assumed that children must exploit grammatical relations to formulate a generalization based on two types of positive data (PD) - data about the consistent role of subjects in the interpretation of reflexives (PD I) and data about relative status of other grammatical relations in the Relational Hierarchy (PD II). In particular, it was hypothesized that after a period of confusion (e.g., K1), children initially make use of PD I to establish the hierarchy in ((1b) below). It was also proposed that the PD II can then be used to confirm this early hypothesis and to trigger the development of Stage III in (1c). This developmental sequence is summarized as follows.

(1) The Development of Relational Hierarchy:

a. Stage I: No Knowledge (K1)

b. Stage II: S > ..O..G..(K2-G3)
c. Stage III: S > O > G (G5)

Note to Chapter 5

1. Note that this can be viewed as another example of Slobin's observation that semantically consistent rules are acquired earlier than less consistent ones (Slobin 1973:207).

PART III

NULL ANAPHORA

CHAPTER 6

BRANCHING DIRECTION AND THE DEVELOPMENT OF NULL ANAPHORA

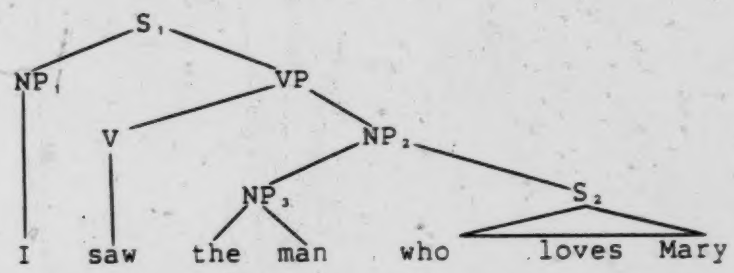
6.0 Preface

Chapters three to five have been devoted to examining the development of reflexive anaphora in Korean. The present chapter studies the development of null anaphora, with special attention to whether Korean children's use of null anaphora exhibits the type of directionality preference predicted by Lust & Mangione (1983). The crucial notion underlying Lust & Mangione's theory is that of 'principal branching direction' which is discussed below.

6.1. Branching Direction and Universal Constraint

A language which positions major recursive elements (e.g. relative clauses, that-complements) to the *right* of the head or 'nucleus' of a phrase is considered to be 'right-branching'. English belongs to this category, as the following syntactic tree illustrates.

(1)

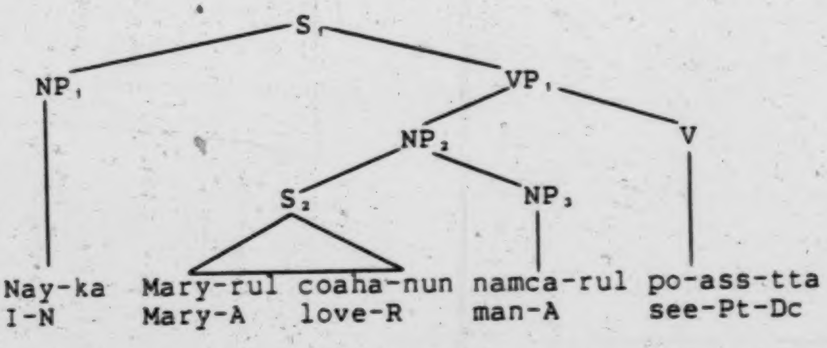


Notice that in (1) the relative clause structure (i.e., S_2)

is attached to the *right* of the head the man (NP_3).

There are also languages which are dominantly 'left-branching'. Korean is such a language, as shown by the structure associated with the equivalent of English (1).

(2)



As (2) shows, the relative clause structure (S_2) is attached to the *left* of the head noun man (NP_3). Languages which position recursive structures in this way are considered to be 'left-branching'.

In recent years a good deal of research has been devoted to the question of whether a language's 'branching direction' affects the way in which children develop null anaphora. Lust & Wakayama (1981:80-81) tested eighty-one Japanese children aged 2;5 - 5;10 on coordinate structures involving so-called 'conjunction reduction'.

(3) Forward Reduction

Tom played and Ø worked.

(4) Backward Reduction

Tom Ø and Mary laughed.

A sentence like (3) is considered 'forward' since the antecedent Tom precedes the reduced element (marked by Ø).

A structure like (4), on the other hand, involves 'backward reduction' in the sense that the deleted element precedes its antecedent laughed. Lust & Wakayama discovered that Japanese children found such backward constructions easier to imitate than forward ones. The mean number of correct imitations for the forward case was 1.21 (out of 2.00) while that of backward was 1.65. (However, the significance of the difference between the two is not reported in their article.)

Lust & Chien (1984), on the other hand, designed a study to compare the performance of Japanese and Chinese (left-branching languages) children with that of learners of English (right-branching language). The structure types illustrated in (3) and (4) above were used. It was found that children learning a left-branching language imitated the backward reductions in coordinate structures better than the forward ones, while the reverse preference was found in children acquiring a right-branching language.

The findings of the two studies just outlined have been taken to indicate that children are aware of the hierarchical structure relations (syntactic dominance relations) in their own language. Lust & Wakayama (ibid.:88), for example, claim that such results suggest that children 'may proceed through the language learning process with a rather complex and abstract sensitivity to order.' Furthermore, Lust & Clifford (in press) propose that branching direction 'reflects the essential dominance direction of a language,' and further observe:

> In a right branching language like English, what precedes will usually also 'c-command' (be related by increased dominance to) what follows ....

Since an NP can typically serve as antecedent for any pronoun which it c-commands, Lust & Clifford therefore predict that forward patterns of anaphora will be the easier type for English-speaking children. In left-branching languages, on the other hand, the reverse is assumed to be true: what follows usually c-commands what precedes. Therefore an NP should generally be able to serve as antecedent for a preceding pronoun, which leads to the prediction that backward patterns of anaphora will be preferred. On the basis of the evidence from Lust & Wakayama (1981) and Lust & Chien (1984), Lust & Clifford further argued that children are 'sensitive to the basic dominance structure of their language during language acquisition,' and 'determine the structure of their anaphora in accord with this dominance structure' (emphasis as in the original).

In the two studies discussed above, children were only tested on coordinate structures. Recently Lust & Mangione (1983) conducted an elicited imitation test on both the coordinate and noncoordinate structures exemplified in (5) below. Subjects were Chinese-, English-, and Japanese-speaking children between the ages of 2;0 - 5;0.

(5) a. Wash Ø and dry the doll.

b. After Ø coming home, Tom watched T.V.

it was found that children acquiring a left-branching language (Japanese and Chinese) showed a 'significant preference for backward directionality in anaphora,' while those learning a right-branching language (English) preferred forward anaphora. On the basis of these findings, Lust & Mangione claim that their study 'provides evidence for sensitivity to the [principal branching direction] parameter in early acquisition (ibid.:155), confirming the hypothesis outlined in (6).

> (6) Universal Constraint on Anaphora (UCA):
>
> In early child language, the direction of grammatical anaphora accords with the Principal Branching Direction of the specific language being acquired. Anaphora is constrained forward in a principally right-branching language. It is constrained backward in a principally left-branching language (ibid.:147, emphasis as in the original).

6.2. Purpose

Since Korean is a left-branching language, if Lust & Mangione are correct, anaphora in Korean children's language should be constrained *backward*. That is, as stated in (1), it is predicted that Korean children would prefer backward anaphora to the forward pattern.

> (1) Hypothesis based on UCA
>
> Korean children will prefer backward anaphora to forward anaphora.

An experiment was designed to test this hypothesis.

6.3. Method

6.3.1. Subjects

Ninety-six children were individually tested, twenty-four children from four age groups (4;1-9;7). The mean age and the age range in each group are shown in Table 6.1 below.

Table 6.1

Subjects

Age Level		Age Range	Mean Age
Kindergarten 1	(K1)	4;1 - 5;3	4;7
Kindergarten 2	(K2)	5;3 - 6;5	5;8
Grade 1	(G1)	6;8 - 7;6	7;1
Grade 3	(G3)	8;7 - 9;7	9;1

6.3.2. Linguistic Materials

In examining children's understanding of anaphora, researchers often make use of an elicited imitation task in which subjects hear a sentence and are asked to repeat it (e.g., Lust 1981). Two types of sentences have been commonly used. One is a 'redundant' structure like (1), in which an NP is unnecessarily (redundantly) repeated.

(1) Mary was sad while Mary was playing ball.

Sentence (1) is considered to be 'redundant' since the second occurrence of Mary is unnecessary in that it normally can be reduced to she as in (1').

(1') Mary was sad while she was playing ball.

The second sentence type used in anaphora tasks is a nonredundant, well-formed sentence containing a pronoun (overt or null) in a forward or backward pattern. Thus children might be asked to imitate a sentence like (2a) or (2b).

(2) a. Forward

John read the play while he smoked a pipe.

b. Backward

After he came home, John went to sleep.

The purpose of employing the elicited imitation task is to see whether and how children modify constructions containing pronouns. Of particular interest is the question of whether children's responses favour a particular pattern of anaphora (forward vs. backward) in accordance with the prediction made by the UCA.

Three types of constructions were selected: sentences involving a redundant NP, forward patterns of anaphora, and backward patterns of anaphora. As in many other languages, redundant NPs are normally avoided in Korean. Thus a sentence like (3) occurs only when a speaker intends to emphasize the NP Tom. We therefore predict that in our imitation task one of the redundant NPs in (3) will often be eliminated by children to create a forward or backward pattern of anaphora, as illustrated in (3').

(3) ([As Tom fought], Tom was scolded by Mother today.)

Tom-i ssawe-se, Tom-i onul emma-hanthey yatan
Tom-N fight-as Tom-N today Mother-from scold

maca-as-e-yo.
receive-Pt-Dc-H (not a passive structure in Korean)

(3') a. Forward

[Tom-i ssawe-se], Ø onul emma-hanthey yatan maca-as-e-yo.

b. Backward

[Ø ssawe-se], Tom-i onul emma-hanthey yatan maca-as-e-yo.

Both the forward and backward patterns of anaphora in (3') have the same interpretation. The only difference between them is that the antecedent precedes the pronoun in the former case while the reverse pattern is found in the latter structure.

Table 6.2 summarizes the types of constructions that were used in my study.

Table 6.2

Sentence Types

Type	Construction	Direction	Examples
I. Redundant	Redundant	NA	(3)
II. Forward	Null	Forward	(3'a)
III. Backward	Null	Backward	(3'b)

Since it is well known that sentence length can have a major effect on results in an elicited imitation task of this kind, the sentence types outlined in Table 6.2 were controlled for length, so that each consisted of eighteen syllables. Three tokens were designed for each type (see Appendix III).

6.3.3. Procedure

6.3.3.1. Pretest

(1) The experimenter (E) showed the subject four dolls, naming them a few times until he/she recognized them correctly.

(2) The E gave the child two or three simple non-anaphoric sentences (e.g., *Tom likes Mary*, etc.), and asked him/her to repeat them. This was to give the child an idea of what he/she was supposed to do.

6.3.3.2. Actual Test

The E gave the child a sentence, and asked him/her to repeat it. The whole session was tape-recorded and the children's repetition was transcribed for later analysis.

6.3.4. Assessment of Children's Responses

In scoring children's responses, errors involving function words (case markers, tense suffixes, and connectives) were ignored. Thus responses which omitted function words but maintained the correct relative ordering of nouns and null pronouns were all considered to be 'correct' imitations. Remaining errors were analyzed to see whether they favoured any particular pattern of anaphora (Forward vs. Backward).

6.4. Results

The results of the imitation task are presented in Table 6.3.

Table 6.3

Korean Children: Percentage of Each Response Pattern

Types	I (Redundant)				II (Forward)			III (Backward)		
Response	C	I			C	I		C	I	
		F	B	Other		B	Other		F	Other
K1	15	78	6	2	89	1	10	38	42	21
K2	28	72	0	0	100	0	0	74	21	6
G1	43	57	0	0	99	0	1	88	10	3
G3	74	26	0	0	100	0	0	97	0	3
Mean	40	58	1	.4	97	.3	3	74	18	8

Note: C=Correct Responses, I=Incorrect Responses; The 'I' category has been divided into two subgroups depending on whether a given sentence is converted into 'forward' (F) or 'backward' (B). The 'other' category consists of failures to respond and incomplete responses.

The data in Table 6.3 shows a strong preference for forward patterns of anaphora. Thus on the average the redundant structures (Type I) were reduced to a forward pattern of anaphora much more frequently (58%) than to a backward construction (1%). In general children were also more successful imitating the forward Type II (97%) than the backward Type III (74%). Furthermore, while the forward type (Type II) was hardly ever converted into a backward pattern (conversion rate = 0.3%), the backward construction (Type III) was changed into a forward type 18% of the time across all age groups.

As expected, not all age groups behaved in the same manner. The preference for forward patterns was strongest among the two younger groups K1 and K2. Thus the K1 children correctly imitated 89% of the forward structures, while correctly imitating only 38% of the backward constructions. 42% of the backward patterns were converted into a forward type. Moreover, the K1 and K2 children converted the redundant Type I structure into the forward pattern 72-78% of the time, but the backward pattern only 0-6% of the time. The G1 and G3 children, on the other hand, succeeded in imitating most of the Type II and III structures (88%-100%). They reduced Type I to the forward pattern 26%-57% of the time, but never converted it to a backward structure.

6.5. Discussion

6.5.1. Korean and Japanese Data

The results in Table 6.3 above clearly indicate that, like English-speaking children, Korean children prefer forward patterns of anaphora to backward structures. This finding is consistent with Lee, Ahn & Lee's (1982:261) observation about Korean children's use of null pronoun in spontaneous speech. Examining production data collected over a period of 26 months from 102 children between the ages of 5;1 and 11;12, Lee, Ahn & Lee found only the forward construction in the speech of younger children. Only in the speech of children over the age of 9;2 did the backward pattern begin to emerge.

Recently, a preference for forward anaphora in Japanese children has also been noted by Suzuki (1985), who studied seventy-two monolingual native speakers living in Iwahune, Japan (ages 3;0-11;0). Suzuki used an imitation task involving the same sentence types (I-III in Table 6.2) used in my imitation task. Her results are presented in Table 6.4 below.

Table 6.4

Japanese Children: Percentage of Each Response Pattern in Suzuki (1985)

Types	I (Redundant)				II (Forward)			III (Backward)		
Response	C	I			C	I		C	I	
		F	B	Other		B	Other		F	Other
K1	6	64	3	28	78	0	22	28	39	33
K2	6	86	0	8	94	0	6	58	28	14
K3	11	89	0	0	100	0	0	86	14	0
G1	31	69	0	0	100	0	0	100	0	0
G3	89	11	0	0	100	0	0	100	0	0
Mean	34	59	1	6	95	0	5	76	16	9

Note: C=Correct Responses, I=Incorrect Responses; The 'I' category has been divided into two subgroups depending on whether a given sentence is converted into 'forward' (F) or 'backward' (B). The 'other' category consists of failures to respond and incomplete responses.

As Table 6.4 clearly shows, Suzuki's results point toward a preference for the forward pattern. For example, on the average the redundant Type I was converted into a forward pattern 59% of the time, while its conversion into a backward type occurred in only 1% of the cases. Furthermore, as in the case of the Korean study, the forward Type II was imitated more successfully than the backward Type III (95% vs. 76%). Significantly, 16% of the backward types were converted into forward patterns, whereas no forward (Type II) structures were changed into backward constructions. As in my study, the preference for forward anaphora was strongest in younger children (K1-K2 in particular).

6.5.2. Problems in Lust & Mangione (1983)

A question now arises with respect to why there is a conflict between the findings obtained by Lust & Mangione (L&M) on the one hand and the results obtained in my study and Suzuki's experiment on the other. Part of the answer seems to lie in the fact that L&M analyzed and presented their results in a somewhat misleading fashion. Consider in this regard the imitation scores reported by L&M.

Table 6.5

Chinese and Japanese Children in Lust & Mangione (1983). Percentage of Correct Imitation

	Chinese		Japanese	
	F	B	F	B
Coordinate	52	73	50(?)	80(?)
Noncoordinate	71	63	38(?)	44(?)

Note: '?' indicates an 'approximate score'. Lust & Mangione do not report exact scores for their Japanese subjects, representing success rates only in a very rough diagram. The scores for Japanese children are therefore from my own calculation made on the basis of the diagram on p. 156 of their article.

As indicated in Table 6.5, L&M made use of both the coordinate and noncoordinate clauses exemplified in (1).

(1) a. Coordinate:

Wash 0 and dry the doll.

b. Noncoordinate (i.e., subordinate-main clauses):

After 0 coming home, Tom watched TV.

On the basis of the findings in Table 6.5, L&M (ibid.:155) claimed to have demonstrated 'a significant preference' for backward patterns of anaphora. Unfortunately, this conclusion requires reconsideration since their analysis combines the scores for coordinate and non-coordinate structures, despite the obvious fact that children performed differently on the two types. For example, it is evident in Table 6.5 that the scores for the backward coordinate constructions are much higher than for the forward ones in both Chinese and Japanese. In fact, the Chinese children performed better on the non-coordinate forward patterns than the backward ones (71% against 63%). Moreover, although Japanese children imitated backward non-coordinate structures a little better than forward constructions (44% against 38%), the difference between the two scores is not obviously significant. (The authors make no mention at all of the statistical significance of any of their differences.)

L&M (ibid.:153) are correct in pointing out that their study 'showed that across all types of structures children never evidenced a significant preference for forward anaphora.' However, their findings do not demonstrate a significant preference for backward anaphora across all structures. Their results only show that children prefer backward patterns in coordinate constructions. Hence the claim (ibid.:155) that children 'consistently significantly favored backward direction of anaphora across both coordination and subordination (i.e., non-coordinate) structures' is too strong, if not totally incorrect.

Although L&M's Universal Constraint on Anaphora seems to be moderately supported by the data from coordinate structures, it is not at all clear that such sentence types even involve null anaphora. Thus many linguists take the position that a sentence such as John and Harry left involves conjoined NPs (cf. (2a)) rather than conjoined clauses with a null verbal element - L&M's null anaphor (cf. (2b)).

(2) a. $[_S\ [_{NP}\ [_{NP}$ John] and $[_{NP}$ Harry]] left].
    b. $[_S\ [_S$ John 0] and $[_S$ Harry left]].

As Dougherty (1970:857) has noted, there are at least some NP coordinations which cannot in fact be analyzed as clausal coordinations.

(3) a. John and Harry are similar.
    b. *John is similar and Harry is similar.

(4) a. John and Bob met.
    b. *John met and Bob met.

If the assumption about the structure of coordination underlying L&M's work is not viable, their findings on coordinate structures would have no bearing on claims about directionality preferences for anaphora since the sentences in question would not even contain implicit (null) pronouns.

Another unfortunate flaw in L&M's study is that the 'forward/backward' contrast in coordinate structures involves an additional variable associated with the choice of conjunctions. Unlike English, where the same conjunction (and) is used in both 'forward' and 'backward' coordinate structures, Chinese and Japanese use two different morphemes depending upon whether the conjunction involves two NPs or PPs as in (5) or two verb phrases (VPs) as in (6). The following examples are from L&M

(*ibid*.:152-154) with the conjuctions underlined.

(5) a. *Chinese* (Forward)

Wanwan $[_{PP}$ xiao gouxiong] *han* Ø $[_{PP}$ xiao huoche].
play with teddy-bear *and* Ø with train

'Play with teddy-bear and Ø train.'

b. *Japanese* (Backward)

$[_{NP}$Sumire] Ø *to* $[_{NP}$tanpopo-ga] saku
violet Ø *and* dandelion bloom

'Violets Ø and dandelions bloom.'

(6) a. *Chinese* (Backward)

$[_{VP}$Xi-yi-xi Ø] *ye* $[_{VP}$ca-yi-ca wawa].
wash Ø *and* dry doll

'Wash Ø and dry the doll.'

b. *Japanese* (Forward)

Inu-wa $[_{VP}$hoeru] *shi* Ø $[_{VP}$kamitsuku].
dog-T bark *and* Ø bite

'(The) dog(s) bark and Ø bite.'

Notice that (5), which involves conjoined NPs and PPs, makes use of *han* (Chinese) and *to* (Japanese). In contrast, (6) uses a different morpheme, *ye* (in Chinese) and *shi* (in Japanese), to mark conjoined VPs. Furthermore, in Japanese coordinate structures consisting of conjoined NPs (Lust's (5b), only *to* can be used, while in the VP structures, several morphemes other than *shi* are possible - *soshite*, *de*, *kara*, or *ato*. Since work by Slobin (1982) and others suggests that childen find it easier to acquire morphemes which are obligatory in a particular context, it is quite possible that the Japanese children's performance was due to early acquisition of *to* rather than branching direction.

Still another problem with L&M's study has to do with the forward non-coordinate structures (e.g. (7)) which they used.

(7) Mama-ga kasa-o otoshita-no, 0 doa-o
Mom-N umbrella-A dropped-COMP 0 door-A

akeru-to.
open-when

'Mom dropped the umbrella, when (she) opened the door.'

Sentences like (7) are unnatural in Japanese in that the matrix verb otoshita is in the middle of the sentence rather than the final position. (A Korean version of (7) is also not very natural.) Furthermore, according to the native speakers I have consulted, coreference between the null pronoun and a subject marked by the nominative ending ga (rather than the topic marker wa) is apparently difficult. It is thus also possible that the unnaturalness of this structure contributed to the children's poor performance on the forward construction.

Suzuki's study, like my own, does not have any of the problems associated with L&M's study since we used only non-coordinate structures with sentence-final matrix verbs and a topic marked matrix subject. My study also did not involve unnatural structures such as (7). These differences from L&M's experiment may explain why their findings pointed toward a radically different conclusion.'

6.6. Summary and Conclusion

This chapter has provided evidence from Korean and Japanese children which disconfirms Lust & Mangione's (1983) universal claim concerning the role of branching direction in anaphora resolution. Since Korean children performed significantly better on the forward patterns of anaphora, just as English-speaking children do, it is tentatively concluded that there is no connection between a language's branching direction and directionality preferences for anaphora in children.

Since both children acquiring a right-branching language (e.g., English) and those learning Korean and Japanese (left-branching languages) imitated forward constructions far better than backward types, at least for noncoordinate structures, it seems reasonable to conclude that children across languages prefer the forward patterns of anaphora, as stated in (1) below.

(1) The Forward Preference Thesis:

> Forward patterns of anaphora are universally preferred in child language.

The 'Forward Preference Thesis' may well be independent of grammatical factors, reflecting instead processing considerations which favour mention of the referent before the use of anaphoric elements. Such a proposal has also been made by O'Grady, Suzuki & Cho (in press) but I will not attempt to develop it further here.

Part IV

EPILOGUE

CHAPTER 7

SUMMARY AND CLOSING REMARKS

7.0. Preface

This thesis has examined syntactic principles governing the reflexive *caki* and how they develop in children ranging in age from 4;1 to 11;7. It has also studied the development of null anaphora, with special attention to whether Korean children's interpretation of null anaphora exhibits the type of directionality preference predicted by Lust & Mangione (1983). An attempt was also made to explore the acquisition problem of why the grammatical principles posited in this thesis are acquired the way they are. Major findings are summarized in 7.1 below.

7.1. Summary of Major Findings

It was found that the forward patterns of anaphora where the choice is between a S(ubject) and an O(bject) or a G(enitive) as antecedent were interpreted better than those in which the choice is between an O and a G. With respect to backward constructions, children performed far better on the *B(SO) type (*Self saw John) than on the *B(OG) structures (*I pushed self in John's room). It was proposed that these findings indicate development of children's grammatical principles as outlined in (1).

(1) a. Relational Hierarchy:

K1: No knowledge
K2-G3: S > ..O..G..
G5: S > O > G

b. Principles:

Choose the highest NP as antecedent.

Coreference is allowed when the antecedent is higher than the reflexive.

Experiments on backward anaphora have inquired into the effect of context on children's interpretation of the reflexive. It was found that while the topic context had a greater effect on children's interpretation than did the neutral context, the older children's (G1-G5) sensitivity to context was highly selective in that it was strongest for *B(SO) and B(OS) (e.g., *Self*, *Tom* saw in a photo).

The role of word order, semantic information, and 'empathy' has also been examined. It was observed that while children seemed to believe that the nominative marked NP is agent (K2-G1) or subject (G3-G5), word order and semantic information play no direct role in the older children's (K2-G5) interpretation of the reflexive. 'Empathy' was found to play a limited role in that it might explain the children's interpretation of the GO forward type (I pushed *Tom's friend* in *self*'s room), but not the G_2S pattern (*Tom's friend* saw *self*). It was also noted that the Discourse Topic Strategy, the Minimal Distance Strategy, and the Recency Strategy could not explain children's behaviour on all structures (forward and backward) used in a discourse context. It was thus proposed that grammatical knowledge, once acquired, overrides pragmatic and processing principles in the selection of appropriate antecedents for caki.

With respect to null anaphora, we have also seen that the universal constraint posited by Lust & Mangione (1983) has to be rejected since children's interpretation of null anaphora was not found to be organized in accordance with branching direction.

7.2. Reflexive Anaphora and Acquisition

We have seen in this thesis that grammatical principles for the interpretation of the reflexive pronoun and acquisitional data interact in several ways. For one thing, syntactic principles played a crucial role in describing and explaining acquisition facts. Thus, the Relational Hierarchy was employed in characterizing the way in which children interpreted the reflexive pronoun, while the notion 'subject' also played a role in identifying how the older chihldren in G1-G5 comprehended active and passive structures. Moreover, the Priority Condition and the Precedence Constraint provided insights into our understanding of what the child's initial grammatical principles might be and how they will further develop.

7.3. Closing Remarks

There remain, of course, a number of problems that this thesis has not covered. For example, the grammatical relations involving the same rank in the hierarchy (e.g., direct and indirect objects) have not been examined. Moreover, within the limited scope of my thesis, I was compelled to focus my discussion more on grammatical factors than on general cognitive constraints relating to memory development, and so on. It is hoped that these and other remaining problems can be pursued in the future.

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APPENDIX I

Test Sentences for *Forward Anaphora*

Type SO

(1) (A pushed B at self's home.)

A-ka B-rul caki-ney cip-eyse mil-ess-eyo.
Ā-N B-A self-G home-L push-Pt-Dc

(2) (C hit D in self's room.)

C-ka D-rul caki-ney pang-eyse ttayri-ess-eyo.
C̄-N D-A self-G room-L hit-Pt-Dc

(3) (B grabbed C in self's neighbourhood.)

B-ka C-rul caki-ney tongney-eyse
B̄-N C-A self-G neighbourhood-L

pwuccaba-ass-eyo.
grab-Pt-Dc

Type OS

(1) (B, A pushed (B) in self's neighbourhood.)

B-rul A-ka caki-ney tongney-eyse mil-ess-eyo.
B-A Ā-N self-G neighbourhood-L push-Pt-Dc

(2) (C, D chased (C) in self's school.)

C-rul D-ka caki-ney hakkyo-eyse ccochaka-ass-eyo.
C-A D̄-N self-G home-L chase-Pt-Dc

(3) (A, C hit (A) in self's room.)

A-rul C-ka caki-ney pang-eyse ttayri-ess-eyo.
A-A C̄-N self-G room-L hit-Pt-Dc

Type S,G

(1) (D, in C's home, pushed self's friend.)

D-ka C-ney cip-eyse caki chinkwu-rul mil-ess-eyo.
D̄-N A-G home-L self friend-A push-Pt-Dc

(2) (C held, in B's school, self's cat.)

C-ka B-ney hakkyo-eyse caki koyangi-rul
C-N B-G school-L self cat-A

anna-ass-eyo.
hold-Pt-Dc

(3) (A held, in D's neighbourhood, self's puppy.)

A-ka D-ney tongney-eyse caki kangaci-rul
A-N D-G neighbourhood-L self puppy-A

anna-ass-eyo.
hold-Pt-Dc

Type G,S

(1) (In D's neighbourhood, B chased self's puppy.)

D-ney tongney-eyse B-ka caki kangaci-rul
D-G neighbourhood B-N self dog-A

ccochaka-ass-eyo.
chase-Pt-Dc

(2) (In C's room, A hit self's friend.)

C-ney pang-eyse A-ka caki chinkwu-rul
C-G room-L A-N self friend-A

ttari-ess-eyo.
hit-Pt-Dc

(3) (In A's neighbourhood, D held self's cat.)

A-ney tongney-eyse D-ka caki koyangi-rul
A-G neighbourhood-L D-N self cat-A

ana-ass-eyo.
hold-Pt-Dc

Type GO

(1) (I pushed the boy's sister in self's room.)

Nay-ka namcaay tongsayng-ul caki-ney cip-eyse
I-N boy sister-A self-G home-L

mil-ess-eyo.
push-Pt-Dc

(2) (I grabbed girl's friend in self's room.)

Nay-ka yecaay chinkwu-rul caki-ney pang-eyse
I-N girl friend-A self-G room-L

cab-ass-eyo.
grab-Pt-Dc

(3) (I hit the boy's friend in self's room.)

Nay-ka namcaay chinkwu-rul caki-ney pang-eyse
I-N boy friend-A self-G room-L

ttayri-ess-eyo.
hit-Pt-Dc

Type G,S

(1) (The girl's brother bought self's hat.)

Yecaay tongsayng-i caki moca-rul sa-ass-eyo.
girl friend-N self hat-A buy-Pt-Dc

(2) (The girl's friend held self's bag.)

Yecaay chinkwu-ka caki kabang-ul tul-ess-eyo.
girl friend-N self bag-A hold-Pt-Dc

(3) (The boy's sister threw self's ball.)

Namcaay tongsayng-i caki kong-ul tenci-ess-eyo.
boy sister-N self ball-A throw-Pt-Dc

Type Passive

(1) (D was pushed by A at self's room.)

D-ka A-hanthey caki-ney pang-eyse
D-N A-by self-G room-L

mil-li-ess-eyo.
push-PASS-Pt-Dc

(2) (B was pinched by C at self's school.)

B-ka C-hanthey caki-ney hakkyo-eyse
B-N C-by self-G school-L

kkocip-hi-ess-eyo.
pinch-PASS-Pt-Dc

(3) (A was caught by B at self's neighbourhood.)

A-ka B-hanthey caki-ney tongney-eyse
A-N B-by self-G neighbourhood-L

puccap-hi-ess-eyo.
catch-PASS-Pt-Dc

Note: In spoken Korean, the possessive marker uy or ney is optionally used. It is generally true that sentences are often most natural when the marker is omitted. In my experiment, I use the possessive marker only for a locative phrase (e.g., in Tom's home, etc.).

APPENDIX II

Test Sentences for *Backward Anaphora*

Type B(OS)

(1) (Today, self, on T.V., E saw (self).

Onul caki-rul T.V.-eyse E-ka po-ass-eyo.
today self-A T.V.-on E-N see-Pt-Dc

(2) (Earlier, self, in a photograph,
G saw.)

Akka caki-rul sacin-eyse G-ka po-ass-eyo.
earlier self-A photo-in G-N see-Pt-Dc

(3) (This morning, self, on paper, F
drew (self).)

Onul achim-ey caki-rul congi-eyta
this morning self-A paper-on

F-ka kuri-ess-eyo.
F-N draw-Pt-Dc

Type B(GO)

(1) (Earlier, I hit, in self's neighbourhood, B.)

Akka nay-ka caki-ney tongney-eyse
earlier I-N self-G neighbourhood-L

B-rul ttari-ess-eyo.
B-A hit-Pt-Dc

(2) (Earlier, I pushed, in self's room, D.)

Nay-ka akka caki-ney pang-eyse D-rul
I-N earlier self-G room-L D-A

mil-ess-eyo.
push-Pt-Dc

(3) (Earlier, I hit, at self's school, E.)

Akka nay-ka caki-ney hakkyo-eyse E-rul
earlier I-N self-G school-L E-A

ttayri-ess-eyo.
hit-Pt-Dc

Type *B(SO)

(1) (Earlier, self, on paper, drew C.)

*Akka caki-ka congi-eyta C-rul kuri-ess-eyo.
earlier self-N paper-on C-A draw-Pt-Dc

(2) (Self, in a photograph, saw C.)

*Caki-ka sacin-eyse C-rul po-ass-eyo.
self-N photo-in C-A see-Pt-Dc

(3) (Yesterday self, on T.V., saw E.)

*Eceykkey caki-ka T.V.-eyse E-rul po-ass-eyo.
yesterday self-N T.V.-on E-A see-Pt-Dc

Type *B(OG)

(1) (I caught self in A's neighbourhood.)

*Nay-ka caki-rul A-ney tongney-eyse
I-N self-A A-G neighbourhood-L

pwuccab-ass-eyo.
catch-Pt-Dc

(2) (This morning I saw self in C's
neighbourhood.)

*Onul achim-ey nay-ka caki-rul C-ney
this morning-TM I-N self-A C-G

tongney-eyse po-ass-eyo.
neighbourhood L see Pt Dc

(3) (Today I pushed self in G's garden.)

*Onul nay-ka caki-rul G-ney matang-eyse
today I-N self-A G-G garden-L

po-ass-eyo.
see-Pt-Dc

Type F(SO)

(1) (Earlier, C saw, in a photo, self.)

Akka C-ka sacin-eyse caki-rul po-ass-eyo.
earlier C-N photo-in self-A see-Pt-Dc

(2) (Today E drew, with crayon, self.)

Onul E-ka kureyong-uro caki-rul
today E-N crayon-with self-A

kuri-ess-eyo.
draw-Pt-Dc

(3) (H saw, on T.V., self.)

H-ka T.V.-eyse caki-rul po-ass-eyo.
H-N T.V.-on self-A see-Pt-Dc

Type F(OG)

(1) (I saw F in self's neighbourhood.)

Nay-ka F-rul caki-ney tongney-eyse
I-N F-A self-G neighbourhood-L

po-ass-eyo.
see-Pt-Dc

(2) (I pushed E in self's garden.)

Nay-ka E-rul caki-ney matang-eyse
I-N E-A self-G garden-L

mil-ess-eyo.
push-Pt-Dc

(3) (I saw H in self's school.)

Nay-ka H-rul caki-ney hakkyo-eyse
I-N H-A self-G school-L

po-ass-eyo.
see-Pt-Dc

APPENDIX III

Test Sentences for *null anaphora*

Redundant Type

(1) (As B was so cold, B put on a thick coat.)

B-ka nemwu chwuwe-se, B-ka twukkewun opa-rul
B-N very cold-as B-N thick coat-A

ib-ess-eyo.
put on-Pt-Dc

(2) (As C was so sleepy, C went to bed early yesterday.)

C-ka mani colie-se, C-ka ecekkey ilccik
C-N very sleepy-as C-N yesterday early

ca-ass-eyo.
sleep-Pt-Dc

(3) (As D finished homework, D went out to play.)

D-ka swukcey-rul tahay-se, D-ka
D-N homework-A finish-as D-N outside-L play

pak-ey nolle naga-ass-eyo.
outside-L play go-Pt-Dc

Forward Type

(1) (As E fought, (E) was scolded by Mother today.)

E-ka ssawe-se, Ø onul emma-hanthey yatan
E-N fight-as Ø today Mother-from scold

maca-ass-eyo.
receive-Pt-Dc (not a passive structure in Korean)

(2) (As F was so hot, (F) went swimming
with friends.)

F-ka nemwu tewe-se, Ø chinkwu-rang
F-N very hot-as Ø friend-with

swuyeng-hare ga-ass-eyo.
swimming-for go-Pt-Dc

(3) (As G fell earlier, (G) was badly
hurt in (his) leg.)

G-ka akka nemecie-se, Ø tali-rul mani
G-N earlier fall-as Ø leg-A badly

tachi-ess-eyo.
was hurt-Pt-Dc

Backward Type

(1) (As (A) was so hungry, A ate an apple.)

Ø pay-ka kopha-se, A-ka sakwa-rul
Ø stomach-N hungry-as A-N apple-A

mege-ess-eyo.
eat-Pt-Dc

(2) (As (B) had a headache, B went to
a hospital with Mother.)

Ø meri-ka apha-se, B-ka emma-rang
Ø head-N ache-as B-N Mother-with

pyongwon-ey ga-as-e-yo.
hospital-L go-Pt-Dc

(3) (As (C) was a top student, C received
a prize at school.)

Ø pan-eyse ilttung hay-se, C-ka hakkyo-eyse
Ø class-in top achieve-as C-N school-L

sang-ul pata-as-e-yo.
prize-A receive-Pt-Dc

Note: Sentences in this experiment all contain an honorific declarative suffix (-eyo). My pilot study indicated that children seemed to be be relectant to repeat sentences with no honorific markers. This may be because they felt as if they were speaking to the Experimenter, although they were only imitating.